LIVERPOOL JOHN MOORES UNIVERSITY

Joint Maternity Services Needs Assessment Cheshire and Merseyside 2022

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Katinka Weber, Clare Maxwell, Lorna Porcellato, Valerie Fleming

Contact: Professor Valerie Fleming email: v.fleming@ljmu.ac.uk; phone: 015 1231 4017

Faculty of Health, Liverpool John Moores University, Tithebarn Building, 79 Tithebarn St, Liverpool, L2 2ER

Executive summary

Liverpool John Moores University was commissioned by the Cheshire and Merseyside Health Partnership to conduct a re-fresh of the Maternity Services Needs Assessment for Cheshire, Merseyside and West Lancashire (MSNA 2016) particularly in the light of the COVID-19 pandemic. This report focuses on Cheshire and Merseyside and covers nine local authority areas - Cheshire East, Cheshire West and Chester, Halton, Knowsley, St. Helens, Liverpool, Sefton, Warrington and Wirral and their associated NHS Trusts.

It provides quantitative data on a range of indicators derived from a number of relevant and reliable sources and also includes findings from in-depth qualitative interviews and a focus group with service users.

An estimated total of 455,200 women aged 16-45 are currently resident in Cheshire, and Merseyside and around 203,395 individuals (8.15% of the population) are from an ethnic minority background. Several local authorities in Cheshire and Merseyside rank very highly with regards to levels of deprivation, with Liverpool ranking second with regards to the proportion of LOSA's which are in the most deprived 10% nationally and Knowsley ranking third.

Pre-conception and conception

Liverpool had the lowest percentage of women taking folic acid supplements before pregnancy had been confirmed (21.8%), followed by Knowsley (25.1%), St. Helen's (25.3%) and Warrington (26.5%). Cheshire West and Chester, Sefton and Wirral had higher percentages than the national average, with Cheshire East having the highest percentage with 39.5%

In 2019 the percentage of NHS funded infertility treatments in the North West of England was 53%.

In total, there were 21,084 conceptions in Merseyside and 13,666 in Cheshire. The conception rate in five local authorities (Cheshire East, Cheshire West and Chester, Halton, Knowsley, St. Helens and Wirral) was higher than the national average. Knowsley records the highest conception rate with 95.7 conceptions per 1,000 women in the age-group.

The local authorities with the highest teenage conception rates were St. Helens, with 30.2 pregnancies per 1000, and Halton, with 28.9 pregnancies per 1,000. Liverpool recorded 15.5 pregnancies per 1,000 in 2020.

In the nine local authorities, Warrington has the highest percentage of NHS abortions taking place in the independent sector with 95.5%, followed by Cheshire West and Chester (89.1%), and Sefton has the lowest percentage with 39.4%. All but two local authorities (Cheshire East and Cheshire West and Chester) had rates of abortion across all recorded age groups (15-44) higher than the England rate (18.7). Of the nine, Knowsley was the local authority with the highest rate of abortion (30.4 abortions per 1,000. Knowsley had the highest percentage of repeat abortions, and seven further local authorities had percentages

higher than the national average (42.6%). Only Cheshire East (39.7%) of and Cheshire West and Chester (41.7%) had a lower percentage.

Antenatal period

The NHS seasonal influenza vaccination programme showed a mixed picture for the vaccination uptake in pregnant women for 2020-2021. Only two local authorities had an uptake higher than the national average: Cheshire East (44.4%) and Cheshire West and Chester (38.2%). Liverpool had the lowest uptake with 28.5% of pregnant women vaccinated, followed by Knowsley (30.2%) and Halton (31.6%). The UK Heath Security Agency has also reported a significant regional variation in pertussis vaccine coverage. The STP Cheshire and Merseyside covering the Local Authorities featured had lower vaccination rates (an average of 62.3%) for that quarter than the national average (64%). The STP also had a lower than the national average (64.7%) vaccine coverage for the year April 2021 to March 2022 with 63.1%.

With regards to national performance of ID1 HIV Test Coverage, this was 99.8%. All local Trusts performed above the achievable threshold of 99%. In terms of ID2, Timely Referral of Hepatitis B Positive Women for Assessment, national performances (83.2%), as well as the performance in the North West (84.4%), were above the acceptable threshold of 70%.

Liverpool Women's Hospital had the highest number of women recorded with complex social factors (14%), equal to the national average. All other localities had percentages that were lower than the national average. Mid Cheshire Hospital Foundation Trust had the lowest percentage of women recorded to have complex social factors at the time of their booking appointment (2%).

Six out of the nine Local Authorities have percentages of women attending before 10 weeks for their booking appointment higher than the England average of 57.8% in terms of women accessing maternity care early. The Local Authority with the highest percentage of women recorded has having accessed maternity care early is Cheshire East (72.7%). Cheshire West and Chester (70.9%) and Sefton (68.8%) also have significantly higher percentages. Warrington (47.7%) and St. Helen's (55.7%) had lower percentages, and Halton the lowest with 44.4%.

Birth

In 2020, eight out of the nine local authorities had experienced a further drop in total fertility rates, with the exception of St. Helens where the rate had slightly increased. In 2021, however, fertility rates rose again in all but two local authorities. In Warrington the rate dropped from 1.56 to 1.54 and it remained the same in St. Helens (1.63). The local authority with the lowest total fertility rate continued to be Liverpool (1.38). Cheshire East (1.90) had the highest total fertility rate, followed by Knowsley (1.89).

The local authority area with the highest general fertility rate (61.4) was Knowsley (1,807 live births for women aged 15-44), followed by St. Helens (57.1) and Cheshire East (57.0). Liverpool had the lowest general fertility rate with 46.2 live births per 1,000.

Women aged 30-34 made up the largest percentage of all women giving birth across the region in 2020 (33.5%). St. Helen's was the area with the highest proportion of births to mothers under the age of 18, 1.3% compared with the national average of 0.6%. In most cases regionally the percentage of women giving birth in a consultant ward was much higher than that recorded for England (33.6%), ranging between 94.1% for the Liverpool Women's NHS Foundation Trust to 71.2% for the Mid Cheshire Hospitals NHS Foundation Trust. Only Southport and Ormskirk Hospital NHS Trust recorded a percentage that was significantly lower with 42.6%. With one exception, all Trusts also recorded percentages of births that took place in Midwife/ Other Wards that were significantly lower than the national average of 10.6%. However, in the Warrington and Halton Hospital NHS Foundation Trust 16.8% of women gave birth in a Midwife/ Other Ward.

The percentage of births taking place at home varied from 1.2% in St. Helen's to 3.4% in Cheshire West and Chester. The Trust in which the highest proportion of births was carried out by hospital doctors (49.5%) was Countess of Chester NHS Foundation Trust. Nearly the same percentage of births in the Trust were carried out by midwives (49.2%), whilst the number of 'not known' cases was very low (1.3%). The Trust with the highest proportion of births (49.2%) carried out by midwives was Countess of Chester Hospital MHS Foundation Trust. Four further Trusts had percentages significantly higher for midwife-led births than the national average: Mid Cheshire Hospitals NHS Foundation Trust (46.5%), Wirral University Teaching Hospital NHS Foundation Trust (46.3%), Warrington and Halton Hospital NHS Foundation Trust (46.0%) and Liverpool Women's NHS Foundation Trust (45.3%). Over a third of births recorded for the Liverpool Women's NHS Foundation Trust (36.7%) and Warrington and Halton Hospital NHS Foundation Trust (35.7%) were recorded to have been carried out by 'other' including GPs.

Over half of all births at each hospital were spontaneous vaginal births, in line with the national average (53.8%). In most Trusts, around a third of births were by caesarean section (including both elective and emergency caesarean), with Countess of Chester Hospital MHS Foundation Trust seeing the highest proportion of births by caesarean (38.1%).

Few new data have become available with regards to the cost of NHS maternity care. In sum, costs per birth were found to be lowest for planned births at home and highest in obstetric units. With regards to outcomes for the mother planned births at home were the most cost-effective option. However, with regards to the baby, outcomes differed according to whether women had their first baby or their second or subsequent baby at home.

The majority of women at all Trusts gave birth between 30 and 40 weeks' gestation. Liverpool was the Local Authority with the highest rate of preterm births (85.8 per 1,000), followed by Knowsley (82.6 per 1,000). Warrington had the lowest rate (71.3 per 1,000), followed by Wirral (74.5 per 1,000) and Cheshire East (25.2 per 1,000). In terms of the low birth weight for term babies (under 2500g and at least 37 weeks), the percentages for all nine local authorities are below the percentage for England (2.9%). For the indicator 'Low birth weight of all babies', two out of the nine local authorities record percentages above the national figure (6.9%). Cheshire West and Chester has the highest percentage (7.5%), followed by Liverpool (7.3%). Knowsley (6.2%) had the lowest percentage. For the category 'Very low birth weight of all babies' (under 1500 g), the rates are similar to the England rate of 1.0%.

Five of the local authorities had stillbirth rates per 1,000 births that were higher than the rate for England (3.8), and four had rates that were lower. Warrington (4.6 per 1,000) was the local authority with the highest stillbirth rate per 1,000 births, followed by St. Helens (4.4 per 1,000), Cheshire East (4.3 per 1,000), and Halton (4.0 per 1,000) and Knowsley (3.9 per 1,000). Cheshire West and Chester had the lowest rate (2.1 per 1,000), followed by Liverpool (2.7 per 1,000), Wirral (3.0 per 1,000), and Sefton (3.3 per 1,000).

The screening tests offered to babies after birth are the newborn/ infant physical examination, the newborn hearing screening and the newborn blood spot screening. All but one service reported that NP1 met the acceptable threshold of 95%. The exception was Liverpool Women's NHS Foundation Trust (94.6%). East Cheshire NHS Trust was the only Trust to report meeting the target of 100%.

Newborn blood spot screening covers nine rare but serious conditions for which eight of the CCGs in Cheshire and Merseyside have met the acceptable threshold of 95%, with the exception of NHS Southport and Formby (93%). For newborn hearing screening the national performance of NH1 was 98.1%. Two out of six screening services (Liverpool and St. Helens and Knowsley), and the total of the North West region, did not meet the threshold.

Current national and international guidance recommends exclusive breastfeeding for around the first six months of life. Rates of breastfeeding at 6-8 weeks are not available for Halton, Knowsley, Liverpool and Wirral. Whilst the breastfeeding prevalence at 6-8 weeks for Cheshire East was above the national percentage with over half (51.1%) mothers still breastfeeding, the percentages of all other authorities were below the national average. St Helen's (28.9%) had the lowest percentage of mothers continuing to breastfeed at 6-8 weeks. Percentages for infants who were given breast milk as their first feed were higher. However, all local authorities had a lower percentage than recorded for the national level (67.4%). Figures for Cheshire East (65.1%) and Cheshire West and Cheshire (63.1%) were closest to the national percentage. The local authority with the lowest percentage was Knowsley (43.6%) followed by St. Helens (47.9%) and Halton (49.3%).

In terms of the neonatal mortality rate, four of the local authorities had rates that were equal to, or lower than, the national rate (2.7 per 1,000). Cheshire West and Chester had the lowest rate (1.8), followed by Warrington (2.6), and St. Helens and Wirral (both 2.7). Liverpool had the highest rate with a rate (3.7 neonatal deaths per 1,000 births), followed by Knowsley (3.3) and Halton (3.2). Considering the infant mortality rate, five of the local authorities had infant mortality rates which lie over the national average (3.6 per 1,000) with Knowsley recording the highest rate at 5.5 per 1,000 live births, followed by Liverpool (5.2). All Cheshire local authorities had rates lower than the national average, with Cheshire West and Chester recording the lowest rate (2.8 per 1,000 live births). The North West rate of unexplained infant deaths for 2020 was 0.29 per 1000 live births (the same rate recorded for 2019), slightly higher than the England rate.

Detailed local figures are not available for maternal deaths, as numbers of maternal deaths are low in each locality and criteria of anonymity can thus not be met by data providers.

Lifestyle factors before, during and after pregnancy

The percentages of women smoking at their booking appointment varied considerably across the nine local authorities. Liverpool (21.5%) had the highest percentage of women stating at their booking appointment that they smoked and also Knowsley and Halton had percentages that were significantly higher than the national average with 19.2%of women stating that each. Sefton (17.7%) and St. Helens (16.5%) also had percentages well above the national average. Wirral (10.6%), Cheshire East (11.7%) and Warrington (11.8%) had percentage below the national figure.

There is a significant variation between the local authorities in terms of the percentages of women who indicate that they smoked at the time of birth. The only authority with a percentage lower than the national percentage was Warrington (8.2%). Halton had the highest percentage (18.3%) - over double that of Warrington, followed by St. Helens (17.7%). The percentages for Knowsley (13.1%) and Wirral (12.1%) were also significantly above the national average.

Cheshire West and Chester had the lowest level of obesity among women in their early pregnancy (21.1%), followed by Sefton (21.8%); both were below the average for England that year (22.1%). All other local authorities had levels higher than the England average, with Halton having the highest percentage (29.1%), followed by Wirral (26.4%) and St. Helens (25.8%).

The data show that pregnant women with diabetes type 1 in the North West of England reached pregnancy completion at a slightly lower average age (29 years) than England and Wales, but the median age of women with diabetes type 2 was the same as the national average (34 years). Similarly women with diabetes type 1 in the North West had a slightly shorter duration of diabetes (a median of 13 years) than the average for England and Wales (14 years), whilst the median duration for women with diabetes type 2 was the same as the England and Wales average (3 years). The median body mass index for women with both types of diabetes in the North West was similar to that of women in England and Wales in general (type 1: BMI =26; type 2: BMI = 32.7).

The data show that 23% of women did not drink alcohol in 2019, or were non-drinkers. Around 62% of women aged 16 and over had a weekly consumption of 14 units or less, and thus within the UK CMOs' low risk drinking guidelines; 12% drank at increased risk level (14 to 35 units), and 3% drank at a higher risk level (over 35 units).

The survey also recorded data on the level of advice women received with regards to alcohol consumption around and during pregnancy. Midwives were the main source of information with regards to drinking during pregnancy; after birth (mainly with regards to breastfeeding) the main source of information were health visitors (54%) and midwives (45%). Other sources of information mentioned were Surestart centres/ Children's health clinics, the internet and GPs.

We conducted series of focus groups and in-depth semi-structured interviews with women from different minority backgrounds to inform this study. To cover the report's focus on the impact of the COVID-19 pandemic, all participants gave birth between March 2020 and August 2021. The women had between one and seven children. Two women gave birth via

an elective caesarean, two had emergency caesareans and four via spontaneous vaginal births.

The interview data show that the COVID-19 period as such did not have a hugely disruptive influence on the experiences of the women and many women were happy with the care they received. The fact that partners were limited in the time that they could spend in hospital with the mothers and newborns, and therefore having little time to initially bond with the infant, is likely to have been an issue for many families. Moreover, there were organisational issues within the services which affected women's care, which can be attributed to the COVID-19 pandemic, but not in its entirety. This included 1) the reduced number of routine appointments, 2) issues with a lack of coordination between care providers and 3) a lack of clear communication between care providers and the women their pregnancy journey and/ or when in labour. Other key issues were that women were 1) not made sufficiently aware of the procedures and policies surrounding labour and hospital admissions, 2) about the birthing options available to them and 3) about how their choice in birthing location would impact the level of pain relief they could receive. Some women also encountered a lack of compassion, and a lack of support for their choices in labour and birth. More 'kindness', compassion and ultimately respect for the knowledge they had of their own bodies and their choices were among the key messages.

Recommendations for commissioners:

- Develop in-depth accounts of the socio demographic context of each maternity trust area, and identify vulnerable populations to develop targeted policies in order to enhance performance and care for all sectors of the population.

- Review levels of communication between services, and streamline communication.

- Any changes to services and care need to be considered in a holistic way for women and families, so that any local needs are taken into account.

- Continue to ensure the most vulnerable groups who are at increased risk of morbidity and mortality, are identified, and have access to an enhanced level of service.

- Continue to facilitate greater involvement of service users in the development and improvement of local services.

- Conduct a review into reasons behind the rise of births by caesarean sections.

- Develop a solid strategy to deal with various public health issues that impact on the stillbirth rate, such rising obesity levels and linked type two diabetes diagnoses, as well as levels of smoking and alcohol consumption.

- Develop a strategy to ascertain the local level of FASD in the population and highlight the impact of alcohol on pregnancies.

Recommendations for acute Trusts and midwifery teams:

- Ensure that women are aware of where to book in when they find out that they are pregnant, and that they are aware of the need to do this as soon as possible.

- Early in the pregnancy, midwives should provide women with information and opportunities to discuss their options about where they will give birth, so women are able to discuss this with their families and make an informed choice.

- Ensure that women with their second and subsequent pregnancies are clear about their choices.

- Support parents are able to make informed choices feeding their baby, in line with UNICEF UK Baby Friendly Initiative Standards.

- Allow sufficient time for the first 'booking in' appointment, and ensure that it covers all relevant topics, even when women already have older children.

- Ensure there is flexibility in when parents can attend antenatal classes to meet the needs of working families. Consider amplifying the provision through providing online classes to facilitate participation by parents who might otherwise struggle to access services.

- Facilitate interaction between parents, so that they can get to know other parents and access crucial peer support, again, consider to provide online options.

- Ensure that fathers have adequate opportunities to raise issues that are concerning them, and that they have the advice that they need.

- Ensure that all parents are offered adequate advice at all stages of the childbearing continuum, even if they already have older children.

- Given the restriction on the possibilities for the whole family to bond following the birth of a baby, ensure the re-establishment of such possibilities.

- Consider more open visiting hours for partners.

- Ensure that women know where to access child-care for older children, when they are attending antenatal classes, and when they are in labour and when they need to go into hospital or other care settings for treatment.

- Provide support to breastfeeding mothers if they need to seek medical help post-birth so that their infant can be with them and breastfeeding is not disturbed.

- Ensure that women are supported to understand the labour process and that they know where to access the support that they need when they are in labour especially in the early stages before they are admitted to hospital.

- Ensure women are clear about hospital procedures and how to identify when they should travel to hospital during the labour process.

- Provide parents with sufficient information about the risks and benefits of interventions during labour, so that they are able to make informed decisions.

- Develop more targeted campaigns to make parents aware of the risks of such factors as smoking and alcohol consumption during pregnancy.

- Provide parents with information about the benefits (and risks) of vaccinations during pregnancy.

- Provide more information for women who have had a Caesarean section.

- Consider developing, or signposting women to, an app providing advice, and provide a written pack giving information, although literacy levels must always be taken into account.

- If the birth is difficult, provide mental and emotional support.

- Ensure that community services are resourced to deliver the above.

- Remind midwives and other healthcare workers of their responsibility to treat birthing people with care, respect and empathy, to respect women's previous experiences and facilitate their choices wherever possible.

- Remind healthcare professional to maintain open and clear communication throughout the care process involving translators or advocates when required.

Recommendations for universities

- Conduct more research on specific correlations between various indicators and their link to socio-economic factors as evidence base for targeted interventions.

- Conduct in depth research on links between ethnicity and maternity outcomes in all nine local authority areas to develop detailed recommendations.

- Conduct a wider study combining qualitative and quantitative methodologies to capture views of the maternity system in a post-pandemic situation, drawing on a wide sample of the local population.

- Conduct interviews with midwives, to gain a better understanding on what would help them to carry out their roles.

- Facilitate greater emphasis and support for public health issues as part of maternity, and increased awareness of the public health role of the midwife.

- Conduct detailed research on obstacles to inclusion for sectors of the population who struggle to access maternity services or with whom the maternity services struggle to engage.

- Conduct a detailed analysis of levels of deprivation and ethnic composition of the population in the local authorities as the new census data is released in 2023 to inform targeted policy making.

Conclusion

The data demonstrate that local authorities analysed repeatedly fare worse than the national average, or counter national trends across a range of indicators. Among the exceptions is notably the indicator 'complex social factors', where percentages were lower than the national average for women with complex social factors at the time of their booking appointment.

Key areas for action continue to be breastfeeding support, reducing rates of smoking during pregnancy, supporting women with Type 2 diabetes who plan to become pregnant or are pregnant and continuing to provide sexual health education for teenagers.

Acknowledgements

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We also wish to extend our thanks to the outreach team whose members have been extremely helpful in directing us to the various support groups and professional services in the region. We also wish to thank our colleagues providing support in the PSS run programmes, from which we were able to source participants in the qualitative part of the study.

Finally and above all we are extremely grateful to the women and men who gave up their time for us to be interviewed and offer us insights into the care they received during and after pregnancy in the difficult times when the Covid pandemic was at its peak. Your experiences can bring about positive change.

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Acronyms

AMU	alongside midwifery unit
ARBD	alcohol-related birth defects
ARND	alcohol-related neurodevelopmental disorder
BAME	black, Asian and minority ethnic
BMI	body mass index
CCGs	Clinical Commissioning Groups
CMO	UK Chief Medical Officer
DfE	Department for Education
DH	Department of Health & Social Care
EU	European Union
FASD	fetal alcohol syndrome disorder
FMU	freestanding midwifery unit
GDM	gestational diabetes mellitus
HES	Hospital Episode Statistics
HFEA	Human Fertilisation and Embryology Authority
HIV	human immunodeficiency virus
HSE	Health Survey for England
HTN	gestational hypertension
IoD	Indices of Deprivation
IVF	intra vitro fertilisation
JSNA	Joint Maternity Services Needs Assessment Cheshire, Merseyside and West Lancashire
KPI	key performance indicators
LGA	large for gestational age
LGBTQ+	lesbian, gay, bisexual, transgender, queer (or sometimes questioning), and ace
LJMU	Liverpool John Moores University
LOSA	Lower-layer Super Output Areas
MBRRACE-UK	Mothers and Babies: Reducing Risk through Audits and Confidential Enquiries across the UK
MSDS	Maternity Services Dataset
MSNA	Maternity Services Needs Assessment for Cheshire, Merseyside and West Lancashire
MU	midwifery unit
NBS	newborn blood spot screening (also: heel prick test)
NH	newborn hearing screening
NHS	National Health Service
NICE	National Institute for Health and Care Excellence
NICU	Neonatal Intensive Care Unit
NP	Newborn and Infant Physical Examination
NPID	National Pregnancy in Diabetes Audit
NS-SEC	National Statistics Socio-economic classification
OHID	Office for Health Improvement and Disparities
ONS	Office for National Statistics
pFAS	partial fetal alcohol syndrome

PH	Public Health Guideline
PHE	Public Health England
Q	quarter
QOF	Quality and Outcomes Framework
QS	quality standard
RCP	Royal College of Psychiatrists
RCPCH	Royal College of Paediatrics and Child Health
RSMP	North West Regional Strategic Migration Partnership
RSMP	North West Regional Strategic Migration Partnership
SATOD	Smoking Status at Time of delivery
STP	Sustainability and Transformation Partnerships
WHaM	Women's Health and Maternity
WHO	World Health Organisation

1. Introduction

Liverpool John Moores University was commissioned by the Cheshire and Merseyside Health Partnership to conduct a re-fresh of the Maternity Services Needs Assessment for Cheshire, Merseyside and West Lancashire (MSNA), published in January 2016 (commissioned by Cheshire and Merseyside Directors of Public Health). The MSNA 2016 (Lewis et al., 2016) was conducted as part of the 'Improving Me' programme, which is a review programme commissioned to assess and improve maternity provision for women and families within participant Clinical Commissioning Groups' (CCGs) footprint within Merseyside, Warrington, Wirral, and West Lancashire.[1]

The Cheshire and Merseyside Health and Care Partnership considered a re-fresh particularly relevant in the light of the COVID-19 pandemic, which has led to the emergence of additional health needs amongst the local population, as well as changes in the way that maternity services could be delivered, particularly during the phases of stringent lockdown in 2020 and 2021. Moreover, following the NHS Cheshire and Merseyside Equality and Inclusion Strategy (2022 -2026)[2] and the Cheshire & Merseyside Local Maternity System's Equality Strategy, a particular focus of this report is on the needs of women with protected characteristics as identified in the Equality Act 2010 (these include, for instance 'age', 'race', 'disability' and 'religion & belief'), as well as women from backgrounds of social and economic deprivation. In sum, the JSNA 2022 aims to assist the Cheshire and Merseyside Health Partnership's in fulfilling their objective of delivering safer, more personalised care for all women and every baby, improve outcomes, and reduce inequalities, through an assessments of local maternity service provision.

This report covers nine local authority areas in Cheshire and Merseyside - Cheshire East, Cheshire West and Chester, Halton, Knowsley, St. Helens, Liverpool, Sefton, Warrington and Wirral. It also covers the main Trusts providing maternity services in Cheshire and Merseyside - the Countess of Chester Hospital NHS Foundation Trust, Mid Cheshire Hospitals NHS Foundation Trust, Southport and Ormskirk Hospital NHS Trust, St. Helens and Knowsley Teaching Hospitals NHS Foundation Trust, Liverpool Women's NHS Foundation Trust, Warrington and Halton Hospitals NHS Foundation Trust and Wirral University Teaching Hospital NHS Foundation.[3]

Maternity services in Cheshire and Merseyside are predominantly provided by hospital trusts who offer care led by midwives and consultants, in obstetric units or midwife-led

[1]CCGs were clinically-led statutory NHS bodies responsible for the planning and commissioning of health care services for their local area. However, they were dissolved in July 2022 and their duties taken on by the new integrated care systems (ICSs).Seehttps://www.nhsconfed.org/articles/what-are-clinical-commissioning-groups [accessed: 10 December 2022].

[2] See v-03-cheshire-and-merseyside-nhs-edi-strategy-2022-26.pdf (cheshireandmerseyside.nhs.uk) [accessed: 9 December 2022].

[3] For details on the services provided by maternity providers in Cheshire and Merseyside see the 'Improving Me' webpage About Us - Improving me and the improving me dos.pdf (improvingme.org.uk) leaflet [accessed: 9 December 2022].

services (alongside midwifery units or freestanding), and in some cases community midwifery services to support communities and home births. Six of the Trusts are level two providers, offering obstetric and midwifery services; Liverpool Women's NHS Foundation Trust is a level three provider with Neonatal Intensive Care Units (NICUs). Liverpool Women's NHS Foundation Trust is the only specialist Tertiary Trust in the UK purely for women's services and provides specialist maternity and gynaecology services for women, level 3 specialist neonatal intensive care, as well as a specialist fetal medicine unit. There is also a community midwifery service provided by the Bridgewater Community Healthcare NHS Foundation Trust.[4]

This report provides quantitative data on a range of indicators, covering general population statistics, data linked to pre-conception, conception, pregnancy, birth, the postnatal period and general lifestyle factors (such as alcohol consumption, smoking and obesity), putting the local data in a national context. The data focus primarily on women aged 16-45 (or 16-44, depending on the availability of statistical data) and where appropriate puts the data in a wider population context (for instance in the case of alcohol consumption or obesity levels). So that the reader can easily navigate directly to discussions of local data, we have highlighted these throughout the report under the sub-heading 'local data'. In line with the report's aim of helping Cheshire and Merseyside Health and Care Partnership equality work, we identify key priority groups throughout this report and have highlighted where there were differences in outcomes and increased risks for adverse outcomes in pregnancy, during birth, or in the postnatal period among different groups of the population.

The report also includes findings from in-depth qualitative interviews and a focus group with eight women. To cover the focus on the impact of the COVID-19 pandemic, we identified women who gave birth between March 2020 and August 2021. As the MSNA 2016 had highlighted that the need to capture more experiences of the women's' partners with the maternity system, we also spoke to men who became fathers between March 2020 and August 2021 in unstructured interviews. Lastly, this report also includes brief overviews of national policy in each section, as relevant to the indicator, and information on the local population, population projections, ethnic and language diversity and indices of deprivation.

2. Population

An estimated total of 455,200 women aged 16-45 are currently resident in Cheshire and Merseyside (June 2022). This includes 181,200 women in Cheshire, 274,000 in Merseyside (please see table 1 below). Table 1 provides a breakdown of the female population aged between 16 and 45 years by local authority, based on 2018 estimates by the Office for National Statistics for 2022. Liverpool has both the highest number (113,400) and the highest proportion of women aged 16-45 years, with 45% of the entire female population in Liverpool falling into this age group. The lowest percentage of women aged 16-45 years is resident in Cheshire East (30%), but Halton (23,700) has the lowest number of women aged 16-45 years.

[4] See improving_me_dos.pdf (improvingme.org.uk) for further details [accessed: 9 December 2022].

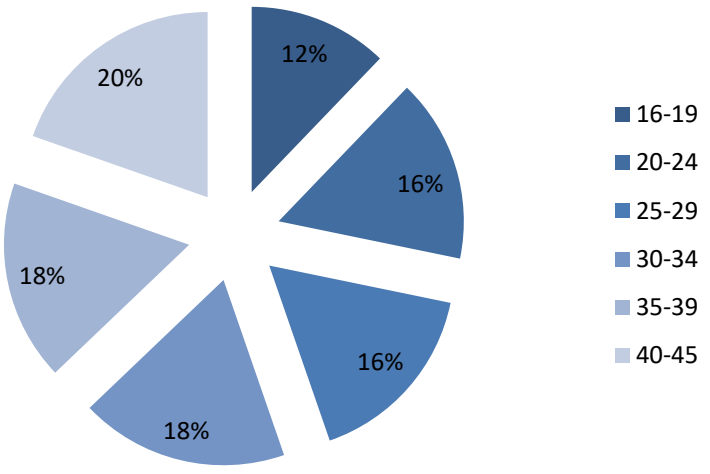
Table 1: Resident females (16-45 years) by local authority (2022)

Local Authority	Number of women (16-45 years)	% population aged 16-45 years
Cheshire East	60,500	30
Cheshire West and Chester	60,100	33
Halton	23,700	35
Warrington	36,800	35
Cheshire	*181,200*	*33*
Knowsley	29,500	37
Liverpool	113,400	45
Sefton	44,500	31
St. Helens	32,300	35
Wirral	54,300	32
Merseyside	*274,000*	*37*
Cheshire and Merseyside	*455,200*	*37*
Total all ages	***1,1291,400***	***100***

Source: Office for National Statistics. Population Projection for 2022, based on 2018 estimates.[5] Please note: Figures rounded to the nearest 100.

Graph 1, below, provides a breakdown of women between 16-45 years of age across Merseyside and Cheshire by age bands. The age distribution is fairly evenly spread across the age bands, with a slightly higher proportion (20%) aged 40-45 years, and a slightly lower proportion aged 16-19 years (12%).

Graph 1: Female Population (16-45) in Merseyside and Cheshire by Age Band (2022)



Source: Office for National Statistics. Population Projection for 2022, based on 2018 estimates.

[5]https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/datasets/localauthoritiesinenglandz1 [accessed: 16/06/2022].

2.1. Population projections

Table 2, below, shows that the population of 16-45 year old women across Cheshire and Merseyside is estimated to increase from 455,200 in 2022 to 471,700 by 2035. Not all local authorities, however, mirror this steady increase in population. Across all nine local authorities, the population in this age group is predicted to rise by 2025, and across all authorities with the exception of Warrington, it is predicted to rise again by 2030. Warrington's population of women in the age group is predicted to increase slightly from 36,800 in 2022 to 37,000 by 2025, but then it is predicted to fall steadily. In six out of the nine local authorities the population of 16-45 year old women is predicted to fall between 2030 and 2035. Whilst Cheshire West and Chester and Knowsley will experience a further small increase in population, Liverpool sees the largest growth of the population in this age band from 2022 (113,400) to 2035 (121,800). The overall population of the UK is projected to increase from an estimated 67.1 million in mid-2020 to 69.2 million in mid-2030 (and increase by 3.2%).[6]

Table 2: Population projections for females aged 16-45 (2025, 2030 & 2035)

Local Authority	2025	2030	2035
Cheshire East	61,200	61,800	61,700
Cheshire West and Chester	61,500	63,100	63,500
Halton	24,100	24,200	23,900
Warrington	37,000	36,600	36,000
Knowsley	30,200	31,100	31,500
Liverpool	115,800	119,800	121,800
Sefton	45,300	46,000	45,800
St. Helens	33,000	33,700	33,500
Wirral	54,700	54,900	54,100
Cheshire and Merseyside	***462,900***	***471,100***	***471,700***

Source: Office for National Statistics. Population Projection for 2025, 2030, 2035, based on 2018 estimates.[7] Please note: Figures rounded to the nearest 100.

2.2. Ethnic Diversity

As the 2021 census data is yet to be published, little additional data have become available with regards to the ethnic composition of the local population since the publication of the MSNA 2016 (Lewis et al., 2016). Table 3, below, shows the counts and percentages of women aged 16-44 recorded in the MSNA 2016 for different ethnic groups across the nine local authorities. All local authorities in Cheshire and Merseyside had a lower proportion of females aged 16-44 years from an ethnic minority background compared with the national average. The local authority with the highest proportion of women aged 16-44 from an ethnic minority background was Liverpool, with 5.5% from an Asian/Asian British background, 2.8% from a Black/ African/ Caribbean/Black British background and 87.1%

[6] https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/bulletins/nationalpopulationprojections/2020basedinterim [accessed: 22 July 2022].

[7] https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/datasets/localauthoritiesinenglandz1 [accessed: 16 June 2022].

identifying as being from a 'White' background. Halton, St Helen's and Knowsley were the Local Authorities with the highest population of women in the age range identifying to be from a 'White' background.

Table 3: Ethnic background for women aged 16-44 (2011)

Local Authority	Total	White (%)	Mixed/ multiple ethnic group (%)	Asian/ Asian British (%)	Black/African /Caribbean/ Black British (%)	Other ethnic group (%)
Cheshire East	64,000	61,000 (95)	800 (1)	1,700 (3)	300 (1)	200 (0.3)
Cheshire West and Chester	60,300	58,200 (97)	600 (0.9)	1,100 (1.8)	300 (5.9)	100 (0.2)
Halton	24,200	23,600 (98)	300 (1)	300 (1)	40 (0.1)	13 (0)
Warrington	38,000	36,100 (95)	400 (1)	1,300 (3.4)	100 (0.3)	100 (0.2)
Cheshire	*186,500*	*178,900 (96)*	*2,100 (1.1)*	*4,400 (2.3)*	*740 (0.4)*	*413 (0.2)*
Knowsley	28,700	27,900 (97)	400 (1)	400 (1)	100 (0.3)	40 (0.1)
Liverpool	104,100	90,700 (87)	2,900 (3)	5,800 (6)	3,000 (3)	1,700 (2)
Sefton	46,300	44,900 (97)	500 (1)	600 (1)	200 (0.3)	100 (0.2)
St. Helens	32,200	31,400 (98)	200 (1)	400 (1)	48 (0.1)	47 (0.1)
Wirral	56,700	54,600 (96)	400 (1)	1,200 (2)	200 (0.2)	100 (0.1)
Merseyside	*268,000*	*249,500 (93)*	*4,400 (1.6)*	*8,400 (3.1)*	*3,548 (1.3)*	*1,987 (0.7)*
Merseyside and Cheshire	*454,500*	*428,400 (94.3)*	*6,500 (1.4)*	*12,800 (2.8)*	*4,288 (0.9)*	*2,400 (0.5)*
England	***10,433,650***	***8,509,100 (82)***	***255,800 (2)***	***1,082,000 (10)***	***458,100 (4)***	***128,700 (1)***

Source: MSNA 2016 (Lewis et al., 2016), based on Office for National Statistic (ONS) 2011 data.[8] Please note: Figures rounded to the nearest 100.

Whilst, as noted, the above table cannot yet be updated to a newer data set, we can draw on additional data to give a more detailed insight into the ethnic composition of nine of the local Health and Care Partnership together with NHS England and Improvement, Public Health England and Champs Public Health Collaborative, implemented a authorities. The caveat is that the available data focused on the population as a whole, rather than solely women in the age group 16-44. In response to the health inequalities highlighted by the Covid-19 pandemic, the Cheshire and Merseyside research project to gain a better

[8] https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/datasets/localauthoritiesinenglandz1 [accessed: 16 June 2022].

understanding of the pandemic on black, Asian and minority ethnic (BAME) communities.[i] The first stage of this research was the development of a detailed overview of the BAME population across Cheshire and Merseyside, as well as a detailed breakdown of the ethnic composition of the population residing in the nine places within the Partnership (Bene and Boampong, 2020).[9] Based on a combination of population estimates (by local authority, broken down by age) from the Office for National Statistics and the (higher resolution) school census for 2019/2020 from the Department for Education, the team generated data on the ethnic mix per neighbourhood within Local Authority areas.[10] Moreover, following the School Census Records, the research breaks ethnicity down into more detailed categories than ONS projections and includes more details on the main languages spoken by the local population in addition to English, and religions.[11]

Table 4 shows that across Cheshire and Merseyside, around 203,395 individuals (8.15% of the population) are from an ethnic minority background. The largest group identifies to be from 'Any Other White Background' (2.28%), followed by 'Any Other Mixed Background' (0.97%), 'Another Ethnic Group' (0.85%) and 'Any Other Asian Background' (0.57%). These categories are of course very broad and vague and it is questionable how much they really represent any individual's ethnic self-identification. However, this is the only data available. Table 5 demonstrates that Liverpool has the highest percentage population from a minority background (15.78%), followed by Cheshire East (10.12%) and Warrington (9.31%), with Halton having the lowest (1.31%).

Table 4: Breakdown of ethnic groups

Ethnic Group	Count	Percent
Any Other White Background	56,861	2.28
Any Other Mixed Background	24,185	0.97
Any Other Ethnic Group	21,185	0.85
Any Other Asian Background	14,200	0.57
African	12,427	0.50
White and Asian	11,667	0.47
Indian	9,759	0.39
Any Other Black Background	8,826	0.35
White and Black Caribbean	8,416	0.34
White and Black African	8,150	0.33

Table 5: Ethnic minority population by place

Local Authority	Count	Percent
Liverpool	78,694	15.78
Cheshire East	38,806	10.12
Wirral	23,015	7.10
Warrington	19,533	9.31
Sefton	13,283	4.79
Cheshire West & Chester	10,961	3.19
Knowsley	8,757	5.81
St. Helens	8,670	4.81
Halton	1,676	1.31
Total	***203,395***	***8.15***

[9]Please find more details of the project at: https://www.cheshireandmerseysidepartnership.co.uk/getting-under-the-skin-resources/ [accessed: 28 June 2022].

[10]1)https://www.ons.gov.uk/peoplepopulationandcommunity/culturalidentity/ethnicity/datasets/populationestimatesbyethnicgroupenglandandwales(accessed: 16 June 2022).

2) https://explore-education-statistics.service.gov.uk/find-statistics/school-pupils-and-their-characteristics/2019-20#dataDownloads-1 [accessed: 16 June 2022].

[11]The report points to limitations in the model they used and note that the aim was not to arrive at definitive numbers. The data can be nevertheless be used 'to determine where there are likely to be higher numbers of BAME residents in any given area' (Bene and Boampong, 2020, p.4).

Chinese	7,896	0.23
Pakistani	5,834	0.23
Bangladeshi	4,391	0.18
Irish	3,817	0.15
Gypsy/Roma	3,209	0.13
Traveller of Irish Heritage	1,639	0.07
Caribbean	933	0.04
Total	***203,395***	***8.15***

Source: Data taken from Bene and Boampong (2020), ordered highest to lowest according to population count.

Table 6 provides a more detailed breakdown of ethnic groups by local authority across Cheshire and Merseyside. Liverpool has the highest counts and percentages in eight of the seventeen ethnic categories ('Any Other Mixed Background', 'Any Other Ethnic Group', 'Any Other Asian background', 'African', 'Any Other Black Background', 'Chinese', 'Gypsy/ Roma', 'Caribbean' and 'Irish'). The five largest ethnic groups in Liverpool are 'Any Other White' (16,880 individuals - 3.39%), 'Any Other Ethnic Group' (13,421 individuals - 2.69%), 'Any Other Mixed Background' (9,020 individuals - 1.81%), 'African' (8,358 individuals - 1.68%) and 'Any Other Black Background' (6,398 individuals - 1.28%).

Cheshire East has the highest percentage population who identify as 'Any Other White' (3.73%), with over 14.300 individuals. It also has the largest 'White and Asian' population (3,418 individuals – 0.89%), and the second largest 'White and Black African' population (1,449 individuals - 0.38%) after Liverpool, and the largest population who identify as 'White and Black Caribbean' (2,684 individuals - 0.7%).

Warrington has the largest percentage of individuals who identify as 'Indian' (1,361 individuals - 0.65%), a total count of 1,361, 'Pakistani' (0.54%) and 'White and Black African' (1,088 individuals - 0.52%). Other large minority groups in Warrington are: 'Any Other White Background' (6,689 individuals - 3.19%), 'Any Other Mixed Background' (2,038 individuals - 0.97%), 'Any other Asian Background' (1,575 individuals - 0.75%) and 'White and Asian' (1,418 individuals - 0.68%).

Wirral has the largest Bangladeshi community with 1,824 individuals (0.56%). Other large groups in Wirral, apart from 'Any Other White' (4,911 individuals - 1.52%) and 'Any Other Mixed' (3,045 individuals - 0.94%), are 'White and Asian' (2,285 individuals – 0.71%), 'Any Other Asian' (1,851 individuals – 0.57%) and 'Indian' (1,680 individuals - 0.52%). After Liverpool, Wirral also has the largest Chinese community amongst the nine Local Authorities (1275 individuals - 0.39%).

Table 6: Ethnic Groups by Local Authority in Cheshire and Merseyside

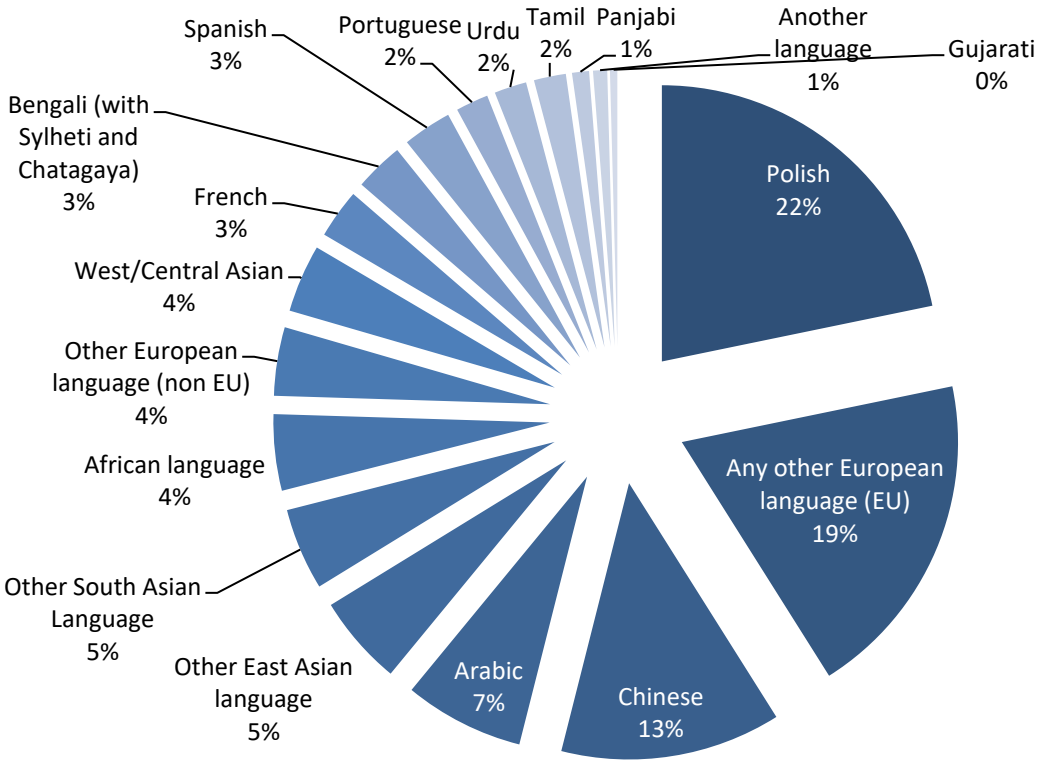
Local Authority	Any Other White	Any Other Mixed	Any Other Ethnic Group	Any Other Asian	African	White and Asian	Indian	Any Other Black	White and Black Caribbean	White and Black African	Chinese	Pakistani	Banglad eshi	Irish	Gypsy/ Roma	Traveller of Irish Heritage	Caribbean
Cheshire East	14,317 (3.73)	4,402 (1.15)	1,424 (0.37)	2,546 (0.66)	1,035 (0.27)	3,418 (0.89)	1,985 (0.52)	610 (0.16)	2,684 (0.7)	1,449 (0.38)	867 (0.23)	1,442 (0.38)	545 (0.14)	678 (0.18)	1,049 (0.27)	229 (0.06)	126 (0.03)
Cheshire West & Chester	3,846 (0.12)	1,174 (0.34)	525 (0.15)	650 (0.19)	400 (0.12)	1,003 (0.29)	472 (0.14)	105 (0.03)	515 (0.15)	490 (0.14)	295 (0.09)	240 (0.07)	276 (0.08)	265 (0.08)	286 (0.08)	374 (0.11)	45 (0.01)
Halton	503 (0.39)	382 (0.3)	178 (0.14)	29 (0.02)	20 (0.02)	107 (0.08)	50 (0.04)	8 (0.01)	124 (0.1)	135 (0.1)	3 (0)	15 (0.01)	5 (0)	47 (0.04)	33 (0.03)	30 (0.02)	7 (0.01)
Warrington	6,689 (3.19)	2,038 (0.97)	1,135 (0.54)	1,575 (0.75)	605 (0.29)	1,418 (0.68)	1,361 (0.65)	450 (0.21)	630 (0.3)	1,088 (0.52)	682 (0.32)	1,134 (0.54)	45 (0.02)	446 (0.21)	98 (0.05)	75 (0.04)	64 (0.03)
Knowsley	2,349 (1.56)	1,239 (0.82)	809 (0.54)	726 (0.48)	524 (0.35)	366 (0.24)	694 (0.46)	352 (0.23)	461 (0.31)	495 (0.33)	220 (0.15)	96 (0.06)	28 (0.02)	247 (0.16)	34 (0.02)	45 (0.03)	72 (0.05)
Liverpool	16,880 (3.39)	9,020 (1.81)	13,421 (2.69)	4,843 (0.97)	8,358 (1.68)	1,693 (0.34)	2,979 (0.6)	6,398 (1.28)	1,896 (0.38)	2,403 (0.48)	3,752 (0.75)	2,185 (0.44)	1,333 (0.27)	1,064 (0.21)	1,503 (0.3)	505 (0.1)	461 (0.09)
Sefton	4,841 (1.75)	1,838 (0.66)	1,468 (0.53)	905 (0.33)	396 (0.14)	810 (0.29)	326 (0.12)	327 (0.12)	446 (0.16)	679 (0.25)	383 (0.14)	87 (0.03)	206 (0.07)	400 (0.14)	53 (0.02)	79 (0.03)	39 (0.01)
St. Helens	2,525 (1.4)	1,047 (0.58)	823 (0.46)	1,075 (0.6)	411 (0.23)	567 (0.31)	212 (0.12)	248 (0.14)	419 (0.23)	267 (0.15)	419 (0.23)	95 (0.05)	129 (0.07)	151 (0.08)	85 (0.05)	185 (0.1)	12 (0.01)
Wirral	4,911 (1.52)	3,045 (0.94)	1,402 (0.43)	1,851 (0.57)	678 (0.21)	2,285 (0.71)	1,680 (0.52)	328 (0.1)	1,241 (0.38)	1,144 (0.35)	1275 (0.39)	540 (0.17)	1,824 (0.56)	519 (0.16)	68 (0.02)	117 (0.04)	107 (0.03)

Source: Data taken from Bene and Boampong (2020).

2.3. Language diversity

As noted, Bene and Boampong's (2020) report provides details for the languages spoken in Cheshire and Merseyside in addition to English. The total count of foreign language speakers in Cheshire and Merseyside is 65,031. The four most prominent languages spoken across the region, in addition to English, are Polish (22% of total foreign language speakers) Chinese (13%) and Arabic (7%). Nineteen per cent of the spoken languages fall within the category 'any other EU language' (within the EU). This category is rather broad and sub-groups would have been useful here. This category excludes the speakers of French, Spanish and Portuguese which are listed separately below. Of course, speakers of these languages may have an EU background, or links to elsewhere where the language is spoken.

Graph 2: Languages spoken in Cheshire and Merseyside



Source: Data taken from Bene and Boampong (2020).

Table 7: *Speakers by language*

Total Speakers	**65,031**

Polish	14,152
Any other European language (EU)	12,542
Chinese	8,388
Arabic	4,562
Other East Asian language	3,428
Other South Asian Language	3,119
African language	2,900
Other European language (non EU)	2,608
West/Central Asian	2,582
French	1,875
Bengali (with Sylheti and Chatagaya)	1,866
Spanish	1,859
Portuguese	1,243
Urdu	1,231
Tamil	1,218
Panjabi	645
Another language	535
Gujarati	278

Source: Data taken from Bene and Boampong (2020).

2.4. Asylum Seekers

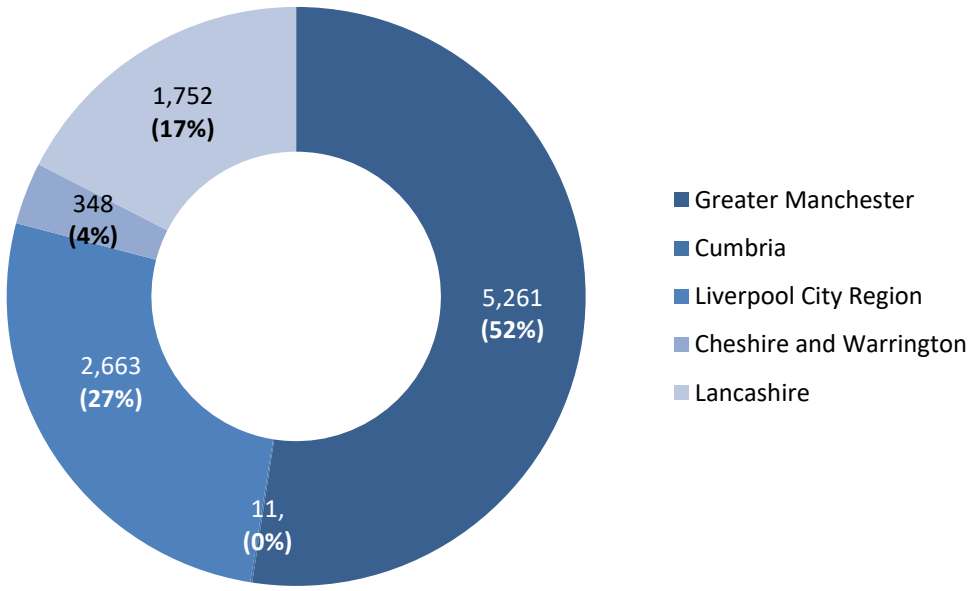
Home Office (2022) figures show that there were 55,146 asylum applications (relating to 65,008 people) in the UK in the year ending March 2022. The Home Office notes that 'this was 56% more than in the year ending March 2020 and the highest number for almost two decades'.[12] As the North West Regional Strategic Migration Partnership (RSMP) explains, the markedly lower figures in March 2020 and March 2021 reflected the impact of the Covid-19 pandemic on the operational capacity of the UK immigration system, as well as on restricting the movement of migrants.[13] According to the RSMP, the North West of England's share of the overall UK asylum seeker population in March 2022 was 21% (similar to the March 2021 figure), a rate of 13.6 asylum seekers per 10,000 people in the region.

[12] The Home Office adds that it is, however, around a third of the level of the previous peak in asylum applications in 2002 (84,132 applications), (which was partly driven by conflict and political unrest in countries such as Iraq, Afghanistan, Zimbabwe and Somalia). Find the Home Office (2022) statistical bulletin 'National statistics: How many people do we grant asylum or protection to?' here : https://www.gov.uk/government/statistics/immigration-statistics-year-ending-march-2022/how-many-people-do-we-grant-asylum-or-protection-to#asylum-applications [accessed: 1 December 2022].The Home Office adds that it is, however, around a third of the level of the previous peak in asylum applications in 2002 (84,132 applications), (which was partly driven by conflict and political unrest in countries such as Iraq, Afghanistan, Zimbabwe and Somalia).

[13] https://northwestrsmp.org.uk/statistics/ [accessed: 1 December 2022].

The RSMP states that in March 2022 there were a total of 10,035 asylum seekers placed in dispersed accommodation located in the North West.[14] This represents an increase of 1396 from the previous year. For comparative purposes, Graph 3 shows the percentage of asylum seekers beyond the boundaries of this JSNA; it includes the North West sub-regions of Greater Manchester, Cumbria and Lancashire in addition to the Liverpool City Region, Cheshire and Warrington for March 2022.

Graph 3: Asylum Seekers in the North West (March 2022)



Source: North West Regional Strategic Migration Partnership, 'North West Statistics' (2022).[15]

2.5. Indices of deprivation

The Indices of Deprivation – IoD (2019) provide a set of relative measures of deprivation for small areas (Lower-layer Super Output Areas - LOSA) across England, based on seven different domains (income deprivation; employment deprivation; education, skills and training deprivation; health deprivation and disability; crime, barriers to housing and services; living environment deprivation).[16] In addition, there are seven domain-level Indices, and two supplementary Indices: the Income Deprivation Affecting Children Index

[14] https://northwestrsmp.org.uk/statistics/ [accessed: 1 December 2022].
[15] https://northwestrsmp.org.uk/statistics/ [accessed: 6 July 2022]. RSMP notes that 'the figures reflect the number of people in receipt of support as at the end of the period, rather than the total supported throughout the period. The figures do not include people in initial and contingency accommodation'. Please see RSMP's North West Statistics for more detailed information.
[16] The Ministry of Housing, Communities and Local Government (2019, p.7)explains that 'each of these domains is based on a set of indicators. Each indicator is based on data from the most recent time point available on a consistent basis across neighbourhoods in England'.

and the Income Deprivation Affecting Older People Index. The Index of Multiple Deprivation 2019 domain Indices and the supplementary Indices, together with the higher area summaries, are collectively referred to as the Indices of Deprivation 2019 (IoD2019).

As table 8 demonstrates, a number of local authorities in Cheshire and Merseyside rank very highly with regards to levels of deprivation, with Liverpool ranking second with regards to the proportion of LOSA's which are in the most deprived 10% nationally and Knowsley ranking third. Other local authorities that were ranked high were Halton (ranked 13) and St. Helens (ranked 28). Knowsley also ranked highly in terms of income deprivation (rank 2), followed by Liverpool (rank 4). As graph 4 demonstrates, in 2019 around a quarter of the local population lived in income deprivation in Knowsley (25.1%) and Liverpool (23.5%) and also Halton (18.5%), St. Helens (18.2%), and Wirral (17.4%) had very high levels.

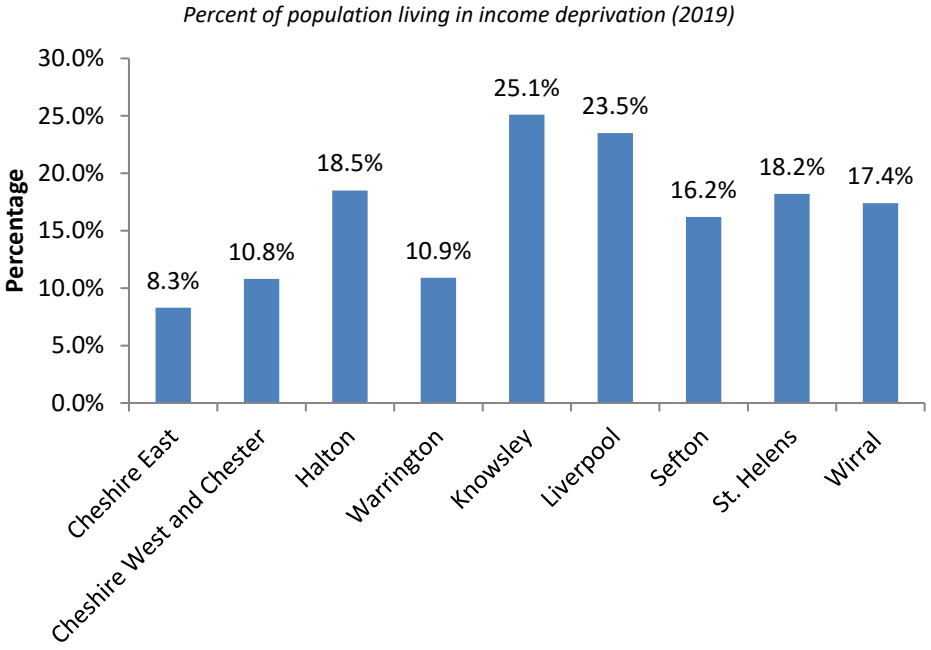
Table 8: Proportion of LOSAs per local authority in the most deprived 10 percent nationally (rank), IOD local author score and rank of income deprivation (2021)

Local Authority	Proportion of LOSA in the first IoD decile (rank out of 317)	IoD Local Authority Score (317 in total)[17]	Income deprivation (rank out of 316)*
Cheshire East	171	216	226
Cheshire West and Chester	101	161	161
Halton	13	23	31
Warrington	96	148	153
Knowsley	3	2	2
Liverpool	2	3	4
Sefton	43	58	54
St. Helens	28	26	33
Wirral	24	42	38

Source: Data taken from the IoD 2019 – Interactive dashboard – local authority focus and 'Income deprivation' data from Office for National Statistics (2021) 'Exploring local income deprivation'.[18]

[17] This is an 'average score that summarises the average level of deprivation across an area based on the scores of all neighbourhoods contained within'. See Microsoft Power BI [Accessed: 5 December 2022].
[18] Find the IoD data here: Microsoft Power BI and the ONS data here: Exploring local income deprivation (ons.gov.uk) [Accessed: 5 December 2022].

Graph 4: Percent of population living in income deprivation (2019)



Source: Office for National Statistics (2021) 'Exploring local income deprivation'.[19]

3. Pre-conception and conception

3.1. Folic acid use

The National Institute for Health and Care Excellence (NICE) Public Health Guideline on maternal and child nutrition (PH11) states that health care professionals (and others whose services cater for the relevant demographic) should advise women who may become pregnant, or are in the early stages of pregnancy, to take 400 micrograms of folic acid (vitamin B9) daily before pregnancy, and throughout the first 12 weeks.[20] PHE (2018) highlights that this can significantly reduce the risk of neural tube defects, such as spina bifida and anencephaly, in unborn babies. Additionally, they urge women of childbearing age to consume food and drinks rich in folic acid.[21]

PHE (2018, p.21) reports that nationally, the proportion of women taking folic acid supplements before pregnancy decreased from 35% in 1999-2001 to 31% in 2011-12. In a study, which draws on maternity services dataset antenatal booking data from January to December 2017, PHE (2019c) states that of those women for which the data was available

[19] Find the ONS data here: Exploring local income deprivation (ons.gov.uk) [Accessed: 5 December 2022].
[20] https://www.nice.org.uk/guidance/ph11/chapter/4-recommendations#folic-acid-2[accessed: 13 July 2022].
[21] The guidelines state that PCTs GPs should prescribe 5 milligrams of folic acid a day for women who are planning a pregnancy, or are in the early stages of pregnancy, if there is a family history of neural tube defect, or they or their partner have a neural tube defect, they have has a previous child with a neural tube defect, or they have diabetes.

(65.5% of 440,445 women), 28.2% stated that they took a folic acid supplement in preparation for pregnancy.[22]

There are variations in the use of folic acid by women, according to age, timing, social deprivation and ethnicity. With regards to age, according to the above-mentioned PHE report (2019c), young women were least likely to take folic acid pre-pregnancy. Of those aged under 18, 6.5% and 14.0% of women aged 18 to 24reported having taken folic acid. The age group who reported the highest use of folic acid prior to pregnancy was women over 40 (37.7%), followed by women 35 to 39 (36.7%) (Public Health England, 2019c, pp.21, 69).

The percentage of women who started taking folic acid supplements once pregnancy had been confirmed are concurrently higher. Of those aged 18 and under, 69.6% reported they started taking folic acid when pregnant. Women aged 18 to 24 had the highest percentage with 70.8%, followed by women aged 25 to 29 (65.7%), 30 to 34 (59.6%), 35 to 39 (57.2%). As the group of women over 40 had the highest percentage of taking folic acid prior to pregnancy, it concurrently had the lowest of those starting to take the supplement once pregnancy had been confirmed (55.2%). This is because a large proportion of the women in this group were already taking folic acid prior to pregnancy (Public Health England, 2019c, p.69).

Further, PHE found that 'whether or not a woman takes a folic acid supplement is associated with deprivation' (2019c, p.21). Whilst 15.2% of the women living the most deprived decile reported taking folic acid prior to pregnancy, this figure increases to 42.5% in the least deprived decile (Public Health England, 2019c, pp.21, 70).

Lastly, there is a variation between women from different ethnic backgrounds. Women from 'Chinese' (34.4%) and 'White' (29.6%) ethnic backgrounds, and those for which ethnicity was 'Not known/stated' (31.9%)were most likely recorded as taking folic acid prior to becoming pregnant, whilst women from a 'Black' (17.6%) or 'Asian' (21.8%) background were least likely to have taken folic acid in preparation of a pregnancy (Public Health England, 2019c, pp.21, 72-73). Again, a higher percentage of women started taking folic acid after their pregnancy had been confirmed; a relatively small overall percentage of women reporting not to have taken folic acid at all.

Women from a 'Chinese' background had the overall smallest percentage (5.4%) in reporting ***no*** folic acid use either prior, or upon confirmation of pregnancy. This is followed by those for which the ethnicity was 'Not known/stated' (7.8%) and people from a 'White' background (8.5%). Women who identified as 'Black' (14.7%), 'Other' (10.8%), or women whose ethnic background was 'Unknown' (11.0%) had the highest percentages of not taking folic acid during pregnancy (Public Health England, 2019c, p.73).

[22]PHE highlights that as 'over a third of women do not have their folic acid supplement use recorded (34.5%) [...] there could be under or over-reporting for the uptake of folic acid supplements' (2019c, p.22).

Local data

Table 9 shows the percentages of women who took folic acid supplements before pregnancy for the year 2018/2019. Nationally, less than a third of mothers (27.3%) reported that they took folic acid before they were pregnant, a slight fall from earlier figures. Liverpool had the lowest percentage of women taking folic acid supplements before pregnancy had been confirmed (21.8%), followed by Knowsley (25.1%), St. Helen's (25.3%) and Warrington (26.5%). Cheshire West and Chester, Sefton and Wirral had higher percentages than the national average, with Cheshire East having the highest percentage with 39.5%. No figures are available for Halton.

Table 9: Percentage of women who took Folic acid supplements before pregnancy (2018/2019)

Local Authority	Percentage of women taking Folic Acid
Cheshire East	39.5
Cheshire West and Chester	35.4
Halton	-
Warrington	26.5
Knowsley	25.1
Liverpool	21.8
Sefton	28.9
St. Helens	25.3
Wirral	31.8
Cheshire & Merseyside LMS	*27.4*
England	***27.3***

Source: Office for Health Improvement & Disparities, Fingertips/ Public Health Data, 'Child and Maternal Health: Folic acid supplements before pregnancy' (2018/2019).

3.2. Infertility estimates

About 84 out of every 100 couples in the general population (which covers all ages and includes people with fertility problems), who have regular unprotected intercourse (i.e. every 2-3 days), will conceive naturally within 1 year. This percentage rises to 92% after 2 years and 93% after 3 years. NICE defines infertility 'as failure to conceive after frequent unprotected sexual intercourse for one or two years'.[23]

[23] NICE further highlights that this definitions should be treated with caution, as 'the diagnosis of infertility based on a failure to conceive within 1 year may exaggerate the risk of infertility, since up to half of women who do not conceive in the first year are likely to do so in the second year'. See NICE https://cks.nice.org.uk/topics/infertility/ [accessed: 14 July 2022]. Also see: https://www.nice.org.uk/guidance/cg156/resources/fertility-problems-assessment-and-treatment-pdf-35109634660549 [accessed: 14 July 2022].

3.3. IVF cycles

The current NICE guidance states that IVF will be considered for women who try to conceive for a total of 2 years and are having regular unprotected sexual intercourse (this can include up to 1 year before their fertility investigations).[24] According to the Human Fertilisation and Embryology Authority (HFEA) 2021 report 'Fertility treatment 2019: trends and figures', in that year 53,000 women had a total of 69,000 intra vitro fertilisation (IVF) cycles and around 5,700 donor insemination (DI) cycles at HFEA licensed clinics in the UK.[25] HFEA notes that after years of rapid growth, more recently, the number of IVF cycles levelled off and that the 2019 are similar to 2017 levels.

HFEA reports that over the years, IVF has increasingly helped older women, same-sex couples and women without partners to have children. The proportion of IVF cycles undertaken by women aged 40 and over has more than doubled from 10% (689 cycles) in 1991 to 21% (14,761 cycles) in 2019. Although in 2019 treatment of women with a male partner still dominated in IVF treatment (94% in 2019), 2,435 IVF cycles (4% of all cycles) involved a female partner (this is up from 1% in 2009), and 1,470 cycles (2%) involved no partner (also up from 1% in 2009).

HFEA points out that there is a 'post code lottery when it comes to IVF funding', and nationally the NHS funding for IVF cycles has declined (from 40% in 2014 to 32% in 2019). In comparison, in Scotland 62% of cycles were NHS funded, with lower figures for Wales (39%), and Northern Ireland (34%). As funding levels in England are locally determined by Clinical Commissioning Groups (CCGs), there is considerable regional variation. Many CCGs have reduced the available funding for fertility treatment, with some seeing double digit declines. In the East of England the percentage dropped from 54% funded cycles in 2014 to 20% in 2019, in Yorkshire and the Humber they dropped from 41% in 2014 to 25% in 2019 and the South East of England from 44% in 2014 to 31% in 2019. In 2019 the percentage of NHS funded treatments in the North West of England was 53%.[26]

3.4. Conception rates

Since a peak in 2010 (909,245 conceptions), over the past decade there has been an overall fall in conception rate in England and Wales.[27] According to the ONS report 'Conceptions in England and Wales: 2020', the year 2020 saw the sixth annual decline in the conception rate to women aged 15 to 44 in England and Wales (a total of 817,515 conceptions). The 2020 data indicate a 0.4% decrease compared to 2019, which is the smallest year-on-year

[24] https://www.nice.org.uk/guidance/cg156/resources/fertility-problems-assessment-and-treatment-pdf-35109634660549 [accessed: 14 July 2022].
[25] https://www.hfea.gov.uk/about-us/publications/research-and-data/fertility-treatment-2019-trends-and-figures/ [accessed: 10 July 2022].
[26] https://www.hfea.gov.uk/about-us/publications/research-and-data/fertility-treatment-2019-trends-and-figures/ [accessed: 10 July 2022].
[27] https://cy.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/conceptionandfertilityrates/bulletins/conceptionstatistics/2020#:~:text=The%20under-18%20conception%20rate%20fell%20to%2013.1%20conceptions,remained%20around%20a%20quarter%2C%20at%2025.3%25%20in%202020 [accessed: 6 July 2022].

decrease seen over the last five years (73.8 per 1,000 women in 2019 to 73.4 per 1,000 women in 2020).

In general terms, from 2019 to 2020 conception rates increased for women aged 30 years and over and decreased for women less than 30years of age. The largest decrease was seen in the under-20 year olds. Those aged 18 years and younger saw the biggest decrease, with the number of conceptions falling from 15.8 per conceptions per 1,000 women to 13.1 per 1,000 in 2020– a17.1% decrease - continuing the trend of decreasing conception rates since 2007. The age group 'under 20' saw a 13.8% decrease in the conception rate, group 20-24 a 4.2% decrease, with the smallest decrease of 0.6% recorded for women aged 25-29.[28]

For the fourth year in a row, the highest number of conceptions (248,528 conceptions) and the highest conception rate (123.9 per 1,000 women) was recorded for the age groups 30-34. However, in contrast to the four previous years, in 2020, all age groups over 30 saw an increase in conception rates. This ends a four-year run of women over 40 recording the only increase in conception rates. For women aged 30-34 the rate increased from 119.4 to 123.9, for women in age group 35-39 from 65.2 to 66.7, and for group 40 years and over from 16.7 to 17.1.

Local data

According to the ONS (2020), 'London has seen the biggest decrease in conception rates in the last decade from 90.1 conceptions per 1,000 women in 2009 to 76.2 in 2020, a 15% decrease; the North West now has the highest conception rate'. Table 10 shows the number of conceptions and conception rates for local authorities in Cheshire and Merseyside for women 16-44 years. In total, there were 21,084 conceptions in Merseyside and 13,666 in Cheshire. The conception rate in six local authorities (Cheshire East, Cheshire West and Chester, Halton, Knowsley, St. Helens and Wirral) was higher than the national average. Knowsley records the highest conception rate with 95.7 conceptions per 1,000 women in the age-group. This is a marked increase from 85.3 per 1,000 women, recorded for Knowsley for 2013 (Lewis et al., 2016, p.14). Liverpool had the lowest conception rate (70.7 per 1,000), a change from the MSNA 2016 where Cheshire West and Chester had the lowest conception rate (71 per 1,000 women). The rate in Cheshire West and Chester increased to 73.8 per 1,000 (Lewis et al., 2016, pp.13-14).

Tables 10 and 11 below also contain data on the percentages of conceptions leading to terminations of pregnancy (abortions). Nationally, following the trend for previous years, the percentage of all conceptions leading to legal abortions remained around a quarter in 2020 (25.3%). Halton had the highest percentage of conceptions leading to abortion (33.7%), followed by Liverpool (33.5%). This is an increase in percentages of conceptions leading to abortions from figures recorded in the MSNA 2016 for 2013 (Lewis et al., 2016, p.14), which recorded the highest percentage for Liverpool (28.1%). See graph 5 and 6 below for a comparison of the conception rates and percentages of conception leading to

[28] https://cy.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/conceptionandfertilityrates/bulletins/conceptionstatistics/2020#:~:text=The%20under-18%20conception%20rate%20fell%20to%2013.1%20conceptions,remained%20around%20a%20quarter%2C%20at%2025.3%25%20in%202020 [accessed: 6 July 2022].

abortion for the years 2013 and 2020. Further information on abortions across Cheshire and Merseyside is provided in section 3.6 and 3.7, below.

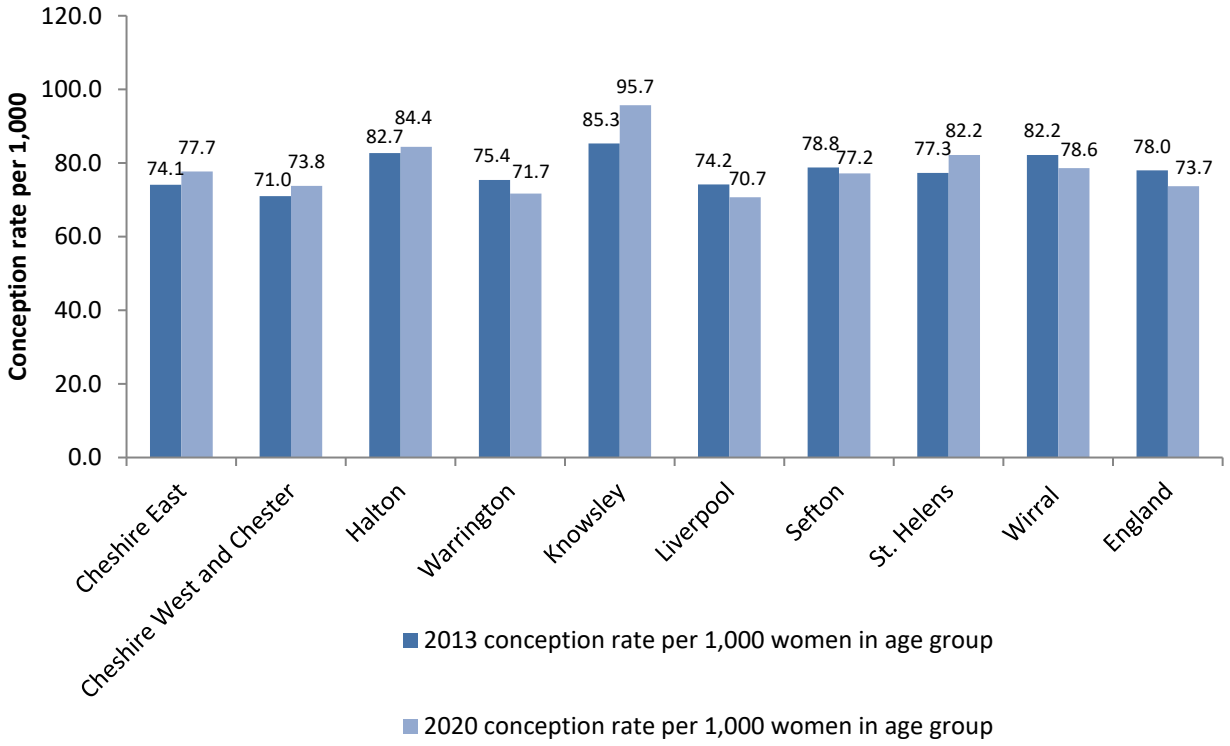
Table 10: Conception rates (16-44) by local authority (2020)

Local Authority	Number	Conception rate per 1,000 women in age-group	Percentage of conceptions leading to abortion
Cheshire East	4,718	77.7	22.6
Cheshire West and Chester	4,326	73.8	25.3
Halton	2,001	84.4	33.7
Warrington	2,621	71.7	28.3
Cheshire	*13,666*	-	-
Knowsley	2,819	95.7	32.6
Liverpool	7,934	70.7	33.5
Sefton	3,411	77.2	28.7
St. Helens	2,623	82.2	31.8
Wirral	4,297	78.6	30.8
Merseyside	*21,084*	*77.4*	*31.8*
LMS Cheshire & Merseyside	*34,750*	-	-
England	**780,013**	**73.7**	**25.3**

Source: Office for National Statistics, 'Conceptions in England and Wales' (2020 Edition).[29] Please note, the data in this dataset are recorded by a woman's usual area of residence.

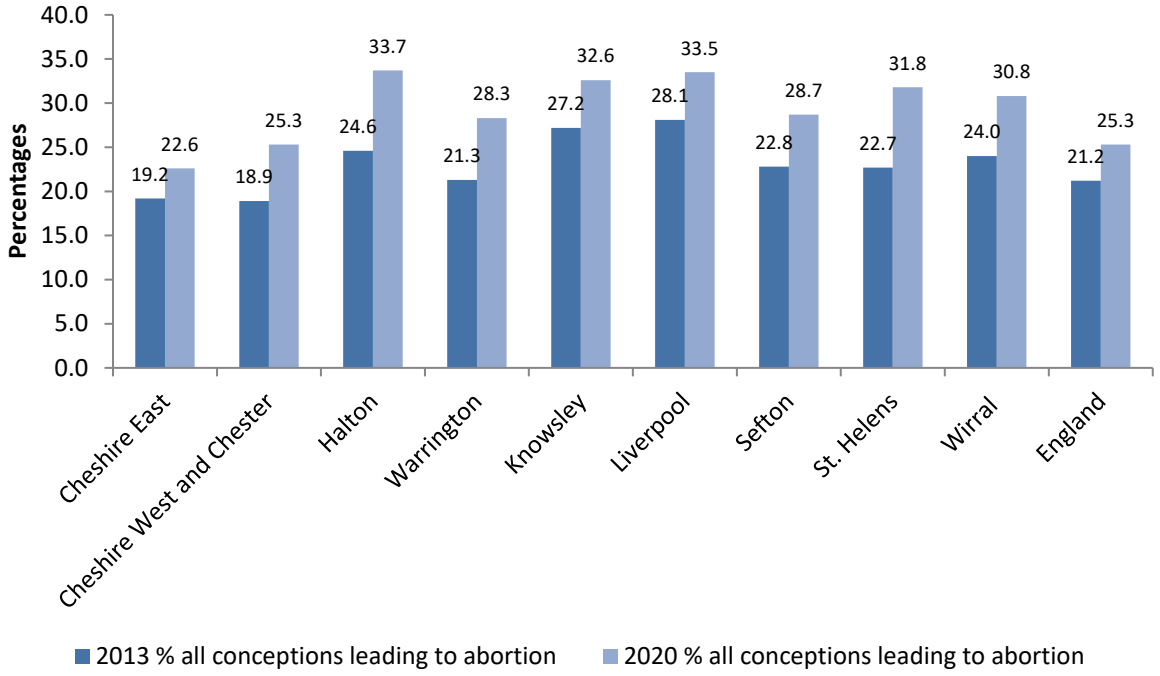
[29] Find the 2020 edition of the dataset 'Conceptions in England and Wales' here: https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/conceptionandfertilityrates/datasets/conceptionstatisticsenglandandwalesreferencetables [accessed: 18 July 2022].

Graph 5: Comparison of conception rates per 1,000 (2013 and 2020)



Source: Figures for 2013 taken from MSNA 2016 (Lewis et al., 2016:14), based on Office for National Statistics 'Conception Statistics England and Wales, 2013' and Office for National Statistics, 'Conceptions in England and Wales'(2020 Edition).Please note, the data in this dataset are recorded by a woman's usual area of residence.

Graph 6: Comparison of percentages of conceptions leading to abortion by local authority (2013 and 2020)



Source: Figures for 2013 taken from MSNA 2016 (Lewis et al., 2016:14), based on Office for National Statistics 'Conception Statistics England and Wales, 2013' and Office for National Statistics, 'Conceptions in England and Wales'(2020 Edition).Please note, the data in this dataset are recorded by a woman's usual area of residence.

3.5. Teenage conceptions per 1000 (women aged under 18)

According to the ONS report 'Conceptions in England and Wales: 2020', the under 18 conception rate for England and Wales has been decreasing each year since 2007, when the conception rate stood at 41.6.[30] It reached a new record low in 2020 at 13.1 conceptions per 1,000, falling 17% from 15.8 per 1,000 women in 2019 - the largest percentage decrease since 2013.According to the ONS (2020), previous government initiatives and socio-economic factors have been the likely drivers of this downward trend over the past two decades. For instance, in response to such factors as the potential negative health consequences of teenage pregnancies and relatively high teenage birth rates in the UK compared to the rest of Europe, the government published the 'Teenage Pregnancy Prevention Framework' in 2018.[31] This is a local teenage pregnancy prevention programme which aims to prevent unplanned pregnancy and promote healthy relationships among young people in England.

[30]See:https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/conceptionandfertilityrates/bulletins/conceptionstatistics/2020 [accessed: 18 July 2022].

[31]https://www.gov.uk/government/publications/teenage-pregnancy-prevention-framework [accessed: 18 July 2022].

Local data

Table 11 shows the conception rates per 1,000 women aged under 18 for the nine local authorities. The local authorities with the highest rates were St. Helens, with 30.2 pregnancies per 1000, a drop from 34.2 in 2013 (Lewis et al., 2016, p.14), and Halton, with 28.9 pregnancies per 1000, a drop from 33.3 (Lewis et al., 2016, p.14). Liverpool, which had the second highest rate at with 34.1 per 1000 in 2013 (Lewis et al., 2016, p.14), saw a drop to 15.5 pregnancies per 1,000 in 2020. As graph 7 demonstrates, in line with the national trend, the teenage conception rate has fallen significantly in all local authorities since 2013 (the data included in MSNA 2016). However, in 2020 the rates in all the Merseyside local authorities, as well as Warrington, were still higher than the national average.

As noted above, the national percentage of all conceptions leading to legal abortions was around a quarter (25.3%) in 2020, and has seen an increase for the sixth year in a row. The percentage of conceptions leading to legal abortions for the age group 'under-18' has been slightly over 50% since 2013, with a small year on year increase.[32] However, in 2020 the under-16 and the under-18 age groups were the only age groups that saw a decrease in percentages of legal abortion to the previous year (54.7% in 2019 to 53% in 2020).[33] Table 11 also shows the percentages of conceptions to women under 18 leading to abortions in the nine Local Authorities in 2020. Warrington had the highest percentage of conceptions leading to abortion (77.4%), and also the percentages for Knowsley (65.6%), Cheshire East (61.1%) and Liverpool (57.3%) were markedly higher than the national percentage. Cheshire West and Chester (50.0%) had the lowest percentage of under-18 conceptions leading to abortion.

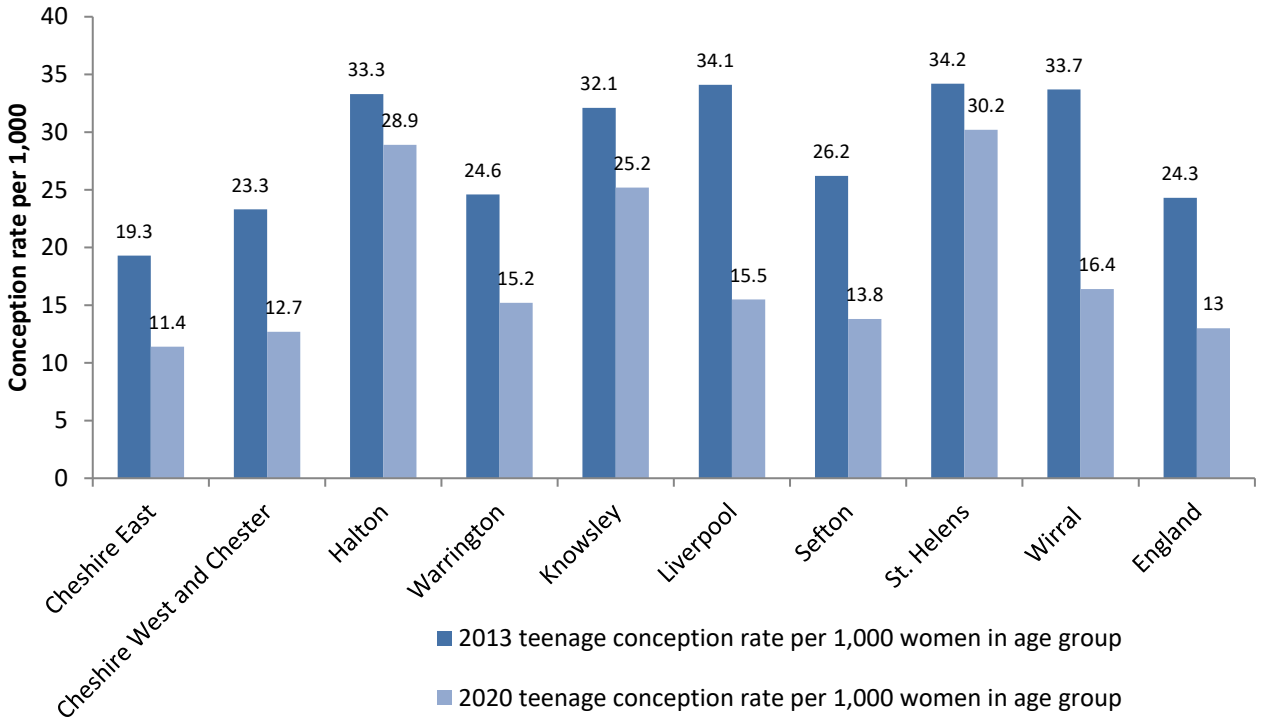
Table 11: Teenage conceptions per 1000 under 18 (2020)

Local Authority	Number	Conception rate per 1,000 women in age-group	Percentage of conceptions leading to abortion
Cheshire East	72	11.4	61.1
Cheshire West and Chester	70	12.7	50.0
Halton	63	28.9	54.0
Warrington	53	15.2	77.4
Cheshire	*258*	-	-
Knowsley	64	25.2	65.6
Liverpool	103	15.5	57.3
Sefton	60	13.8	51.7
St. Helens	85	30.2	55.3
Wirral	88	16.4	54.5
Merseyside	*400*	*18.4*	*56.8*
England	**11,878**	**13.0**	**53.0**

[32] https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/conceptionandfertilityrates/datasets/conceptionstatisticsenglandandwalesreferencetables [accessed: 19 July 2022].
[33] https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/conceptionandfertilityrates/bulletins/conceptionstatistics/2020 [accessed: 18 July 2022].

Sources: Office for Health Improvement & Disparities, Fingertips/ Public Health Data, 'Child and Maternal Health' (2020) [34] and Office for National Statistics, 'Conceptions in England and Wales '(2020 Edition).[35]

Graph 7: Comparison of teenage conception rates per 1,000 (2013 and 2020)



Sources: Figures for 2013 taken from MSNA 2016 (Lewis et al., 2016, p.14), based on Office for National Statistics for 2013 (published 2015). Figures for 2020 from Office for Health Improvement & Disparities, Fingertips/ Public Health Data, 'Child and Maternal Health' (2020) [36] and Office for National Statistics, 'Conceptions in England and Wales '(2020 Edition).[37]

3.6. Legal abortions (terminations of pregnancy)

In 2021, 214,869 abortions were reported in England and Wales, the vast majority (214,256) to residents of England and Wales. This represents an age-standardised abortion rate (ASR) of 18.6 per 1,000 resident women aged 15 to 44. This is the highest rate since the Abortion Act was passed in 1967, exceeding the previous peak in 2020 (18.2 abortions per 1,000

[34]Find Office for Health Improvement & Disparities Fingertips/ Public Health Data for indicators on Child and Maternal Health here: https://fingertips.phe.org.uk/profile/child-health-profiles/data#page/1/gid/1938133222 [accessed: 4 July 2022].
[35]https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/conceptionandfertilityrates/datasets/conceptionstatisticsenglandandwalesreferencetables [accessed: 19/07/2022].
[36]Find Office for Health Improvement & Disparities Fingertips/ Public Health Data for indicators on Child and Maternal Health here: https://fingertips.phe.org.uk/profile/child-health-profiles/data#page/1/gid/1938133222 [accessed: 4 July 2022].
[37]https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/conceptionandfertilityrates/datasets/conceptionstatisticsenglandandwalesreferencetables [accessed: 19/07/2022].

resident women aged 15 to 44). 613 abortions were to women recorded as residing outside England and Wales, a decrease from 943 in 2020 and 2,135 in 2019.[38] In 2021, residents of Northern Ireland accounted for 161 abortions registered for non-residents (26.3% of the total recorded for non-residents), and residents of the Irish Republic for 206 terminations of pregnancy (33.6% of non-residents). The large decrease can be explained, firstly, through travel restriction in place in 2020 and 2021 due to the COVID-19 pandemic, and secondly, legislative changes in the respective countries (Office for Health Improvement and Disparities, 2022c).[39]

Statutory grounds for abortion (under the Abortion Act 1967) can be summarised as instances where a termination is necessary in order to prevent physical or psychological harm to the pregnant women, exiting child(ren) and/or where there is a substantial risk that if a child were born, it would suffer from severe physical or mental abnormalities.[40] The legal limit for abortions is 24 weeks of gestation. However, under certain circumstances, for instance, if the pregnant women's life is at risk, or the baby would be born with severe physical or mental disability, they can be performed later. Nevertheless, the vast majority of abortions are performed at less than ten weeks and this number has seen a continued increase (Office for Health Improvement and Disparities, 2022c). In 2021, 89% of abortions were performed at less than ten weeks, an increase of 10% from 2011 (78%). The percentage of terminations performed at 20 weeks remained at 1% in 2020 and 2021, and abortions at a gestational age of over 24 weeks accounted for 0.1% of the total in 2021 (276 in total).[41] Across the nine commissioning local authorities the majority of abortions take place at 3 to 9 weeks gestation (range 86.4% for Liverpool -90.2% for Warrington), a similar level to the England average (88.6%).[42]

The Office for Health Improvement and Disparities (OHID) (2022c) notes that the proportion of different grounds for abortion in England and Wales in 2021 remained similar to previous

[38] Find abortion statistics for 2021 at: https://www.gov.uk/government/statistics/abortion-statistics-for-england-and-wales-2021 [accessed: 17 August 2022].

[39] See https://www.gov.uk/government/statistics/abortion-statistics-for-england-and-wales-2021 [accessed: 17 August 2022].
Since roughly the 1990s, a large proportion of non-residents were made up of residents from Northern Ireland and the Irish Republic. Apart from COVID-19, what accounts for the drop of women commissioning abortions from the Irish Republic was the overturning of the ban on abortion in May 2018, and for Northern Ireland, the decriminalisation of abortion in through the Abortion Regulations 2022 (Office for Health Improvement and Disparities, 2022c).

[40] Lewis et. al. point out that while abortions are in general carried out because a continuation with the pregnancy would cause significant physical or psychological harm to either woman or child, 'there has been growing concern in recent years that abortion itself may increase psychological risk and adversely affect women's mental health' (2016, p.17). However, this issue has been subject to debate, with studies highlighting that rates of women who report mental health problems are no higher among women having abortions, compared to those who give birth. A history of mental health problems being key to predicting the likelihood mental-health problems after abortions, along with additional factors such as 'pressure from a partner to have abortion, negative attitudes towards both abortion generally and women's personal experiences of abortion' (Lewis et al. 2016, p. 17). Also see Academy of Medical Royal Colleges (2011).

[41] See https://www.gov.uk/government/statistics/abortion-statistics-for-england-and-wales-2021 [accessed: 17 August 2022].

[42] See https://www.gov.uk/government/statistics/abortion-statistics-for-england-and-wales-2021 [accessed: 17 August 2022].

years. The following three grounds account for the vast majority of abortions: firstly, most abortions (209,939 abortions, 98%) were carried out on the grounds that the gestational age did not exceed 24 weeks 'and the continuance of the pregnancy would involve risk, greater than if the pregnancy were terminated, of injury to the physical or mental health of the pregnant woman'. Secondly, 3,370 pregnancy terminations (1.6%) were carried out at any gestational age, due to the substantial risk that 'if the child were born it would suffer from such physical or mental abnormalities as to be seriously handicapped'. Finally, a further 836 abortions (0.4%) were carried out on the grounds that the gestational age did not exceed 24 weeks and that continuing with the pregnancy carried a substantial risk 'of injury to the physical or mental health of any existing child(ren) of the family of the pregnant woman' (Office for Health Improvement and Disparities, 2022c).

There is a variation with regards to the location and funding of abortions. In 2021, 21% of abortions in England and Wales were performed in NHS hospitals and 77% in approved independent sector clinics under NHS contract. In total, 99% of abortions are funded by the NHS, with the remaining 1% being funded privately. The proportion performed in the independent sector has seen a general trend of year-on-year increase since data collection started in 1981.[43] The figures recorded for the MSNA 2016 were 32% for abortions taking place in an NHS hospital, and 66% for the NHS funded independent sector (Lewis et al., 2016, p.16).

Local data

Table 12 demonstrates the considerable variation in abortion provision in terms of location in the nine local authorities covered by this JSNA. Warrington has the highest percentage of NHS abortions taking place in the independent sector with 95.5%, followed by Cheshire West and Chester (89.1%), and Sefton has the lowest percentage with 39.4%. Since 2014 (MSNA, 2016), there has been a significant drop in the percentage of abortions that took place in an NHS Hospital in Liverpool, from 84% in 2014 (Lewis et al., 2016, p.14) to 47,4%.

Table 12: Legal abortions location and funding by Local Authority(2021)

Local authority	Total number of abortions	Percentage of abortions in NHS Hospital (NHS funded)	Percentage of abortions in Independent Sector (NHS funded)	Percentage of Privately Funded
Cheshire East	1,090	16.1	82.8	1
Cheshire West and Chester	1,104	10.1	89.1	0.7
Halton	662	41.5	58.5	0
Warrington	731	3.8	95.5	0.7
Knowsley	948	47.4	52.2	0.4
Liverpool	2,876	47.4	52.1	0.5
Sefton	1,020	59.5	39.4	1.1
St. Helens	841	45.2	54.5	0.4

[43]See https://www.gov.uk/government/statistics/abortion-statistics-for-england-and-wales-2021 [accessed: 17 August 2022].

Wirral	1,329	44.1	55.6	0.3
England	**203,662**	**18.8**	**79.7**	**1.5**

Source: Office for Health Improvement & Disparities, 'Abortion statistics for England and Wales 2021'.[44]

Notably, the COVID-19 pandemic has had an effect on the application of the methods that are used to terminate pregnancies. There are medical and surgical methods to terminate pregnancies; the former has seen a continuous upward trend in the UK since 1991 (when mifepristone received the UK license for use). In 2021, 87% of total abortions were medical, a further increase of 2% to the previous year. Until March 2020, early medical abortions - EMAs (in the first ten weeks, i.e. 9 weeks and 6 days) were carried out by administering the first stage at an NHS or independent provider, and women were allowed to administer the second stage at home (a practice allowed since 2018 for Wales and December 2018 for England). The Department of Health and Social Care (2022) explains that although prior to the pandemic there was 'no legal requirement for at least one of the certifying doctors to have seen the pregnant woman before reaching a decision about a termination, the [DHSC] guidance [2014] expressed [...]. that it is good practice for this to be the case'. From 30 March 2020this practice changed as COVID-19 measures to limit the spread of virus led to a temporary approval that both pills could be taken at home, following a telephone or e-consultation with a clinician and without the need to first attend a hospital or clinic.[45]

As part of the process, the medical practitioner terminating the pregnancy is to certify their 'opinion, formed in good faith, that, if the medicine prescribed for the termination of the pregnancy [...] is administered in accordance with [their] instructions, the pregnancy will not exceed 10 weeks at the time when [...] the first medicine in the course is taken'.[46]The statutory grounds for abortion remained unchanged. Similar measures were put in place by the Welsh government's Minister for Health and Social Services on 31 March 2020. These temporary measures remained in place throughout 2020 and 2021, and were made 'permanent' from 30th August 2022. Taking both medications at home was the most common procedure, accounting for 52% of all abortions in 2021 and data shows that most women are now taking both pills at home following an on-line consultation.[47]

OHID reports variations in abortion rates according to area of residence within England and Wales, age, marital status, ethnicity, and level of deprivation of the area that women live in (Office for Health Improvement and Disparities, 2022b). Firstly, with regards to area of residence (by region), the highest rates of abortion were recorded for the North West (22.0

[44] See https://www.gov.uk/government/statistics/abortion-statistics-for-england-and-wales-2021 [accessed: 17 August 2022].

[45] See Department for Health and Social Care: Home use of both pills for early medical abortion up to 10 weeks gestation - GOV.UK (www.gov.uk) [accessed: 8 November 2022]. Find the temporary approval document here: 30032020 The Abortion Act 1967 - Approval of a Class of Places (publishing.service.gov.uk) [accessed: 8 November 2022].

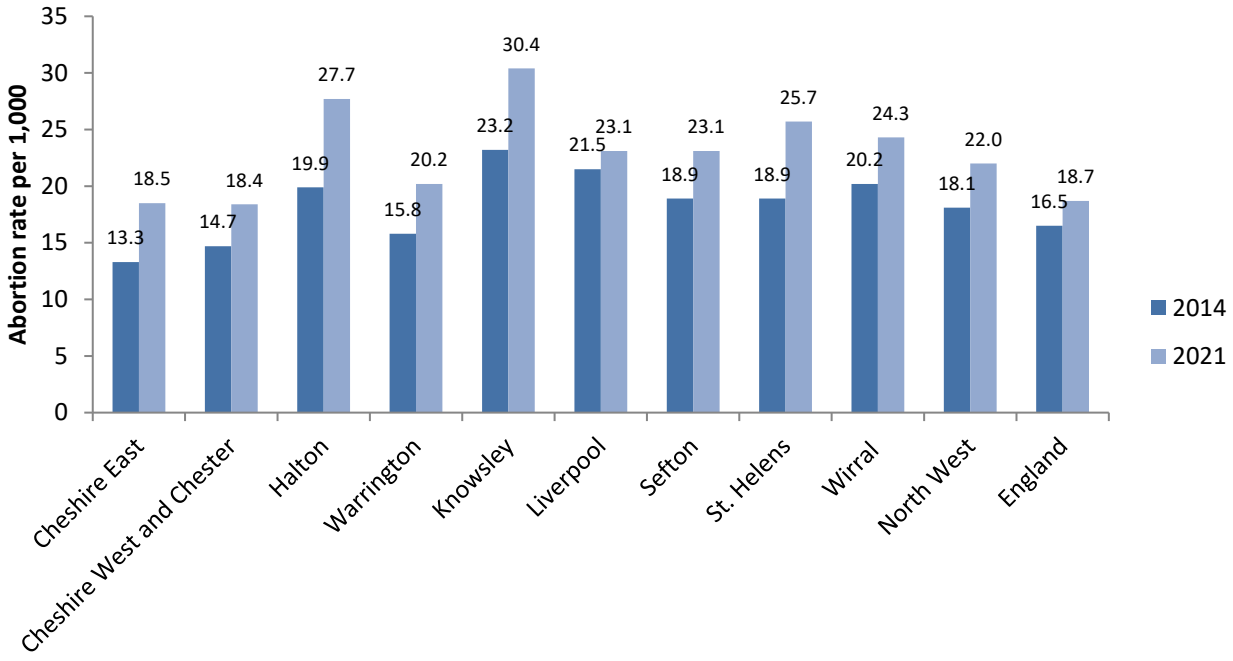
[46] See Form-EMA1.odt (live.com) [accessed: 8 November 2022].

[47]https://www.gov.uk/government/statistics/abortion-statistics-for-england-and-wales-2021/abortion-statistics-england-and-wales-2021[accessed: 20 July /2022].

per 1.000 women aged 15 to 44) and lowest in the South West (15.4 per 1,000 aged 15 to 44).[48]

Table 13 shows that all but two local authorities (Cheshire East and Cheshire West and Chester) had rates of abortion across all recorded age groups (15-44) higher than the England rate (18.7). Of the nine, Knowsley was the local authority with the highest rate of abortion (30.4 abortions per 1,000). As graph 8 demonstrates, this is an increase from 23.2 abortions per 1,000 recorded for the year 2014 (Lewis et al., 2016, p.15). Halton (27.7 per 1,000) also had a significantly higher rate than all other LAs across Cheshire and Merseyside, as well as the England average. Knowsley also had the highest rate among women aged 20-24 years (56.2 per 1,000), 25-29 years (44.0 per 1,000 each), 30-34 (38.0 per 1,000) and women over 35 years of age (15.3 per 1,000).

Graph 8: Comparison of abortion rates in the local authorities (15-44) (2014 and 2021)

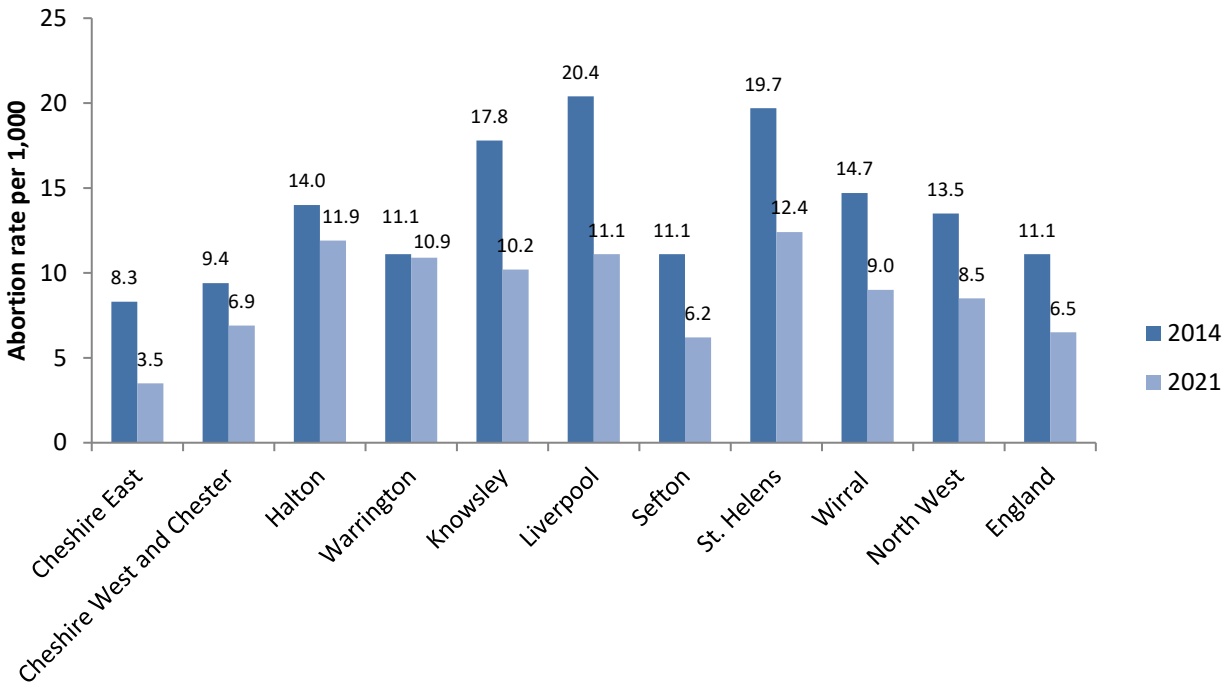


Sources: Figures taken from MSNA 2016 (Lewis et al., 2016, p.15), based on Department of Health and Social Care 2014 statistics and Office for Health Improvement & Disparities, 'Abortion statistics for England and Wales 2021'.[49]

[48] https://www.gov.uk/government/statistics/abortion-statistics-for-england-and-wales-2021/abortion-statistics-england-and-wales-2021 [accessed: 20 July /2022].

[49] See https://www.gov.uk/government/statistics/abortion-statistics-for-england-and-wales-2021 [accessed: 17 August 2022].

Graph 9: Comparison of abortion rates population under 18 (2014 and 2021)



Sources: Figures taken from MSNA 2016 (Lewis et al., 2016, p.15), based on Department of Health and Social Care 2014 statistics and Office for Health Improvement & Disparities, 'Abortion statistics for England and Wales 2021'.

Secondly, regarding age, over the past ten years there has been an increase in abortion rates for all ages above 22 across England and Wales. The largest increase was seen in the age group 30 to 34 (from 17.2 per 1,000 in 2011 to 22.1 per 1,000 in 2021). In contrast, the rate for under-18 year olds significantly declined over the past ten years (from 15.0 to 6.4 per 1.000 between 2011 and 2021), with a particularly large decline for the group of under-16s (3.4 per 1,000 women in 2011 to 1.1 per 1,000 women in 2021). Table 13 contains the figures for the rate of legal abortions per 1,000 per age group for the nine local authorities. As the table and graph 9 above show, for the age group of under-18s, all but two local authorities (Cheshire East and Sefton) had rates per 1,000 women that were higher than the England rate (6.5 per 1,000). St. Helens (12.4 per 1,000) had a rate that was nearly double of that of England. St. Helens also had the highest rate for the age group 18-19 (50.1 per 1,000 compared to 22.4 per 1,000 recorded for England). Four other local authorities also had rates for the group 'under 18' that were higher than 10.0 per 1,000: Halton (11.9 per 1,000), Liverpool (11.1 per 1,000), Warrington (10.9 per 1,000) and Knowsley (10.2 per 1,000).

Table 13: Rate (ASR) of legal abortions per 1,000 population by Local Authority and age group (2021)

Local authority	All women 15-44 (ASR)	95% confidence interval	Under 18	18-19	20-24	25-29	30-34	35+
Cheshire East	18.5	17.4 -	3.5	23.6	36.4	26.1	20.6	10.1

		19.7						
Cheshire West and Chester	18.4	17.4 - 19.6	6.9	22.2	31.4	27.9	23.6	9.2
Halton	27.7	25.6 - 29.9	11.9	45.1	51.8	38.4	30.3	13.3
Warrington	20.2	18.8 - 21.8	10.9	30.9	40.1	26.5	21.2	10
Knowsley	30.4	28.5 - 32.4	10.2	37.3	56.2	44	38	15.3
Liverpool	23.1	22.2 - 24.0	11.1	27.6	33.8	31	30.2	13.7
Sefton	23.1	21.7 - 24.6	6.2	30.2	44.5	33.4	26.2	11.6
St. Helens	25.7	23.9 - 27.5	12.4	50.1	45	39.8	23.8	12.6
Wirral	24.3	23.0 - 25.7	9	41	50.2	37.8	25.4	8.9
North West	*22*	*21.7 - 22.2*	*8.5*	*28.6*	*37.1*	*32.5*	*26.4*	*11.6*
England	***18.7***	***18.6 - 18.8***	***6.5***	***22.4***	***30.9***	***27.3***	***22.5***	***10.7***

Source: Office for Health Improvement & Disparities, 'Abortion statistics for England and Wales 2021'.[50]

Thirdly, with regards to marital status, OHID found that in 2021, 82% of abortions were to women who stated that they were 'Single' (this included the categories 'Single no partner', 'Single with partner', 'Single not stated'). This is in line with percentages recorded for the past ten years.

Fourthly, concerning ethnicity, OHID states that 91% of the forms received for 2021 contained data on ethnicity (95% in 2020). Percentages for women who indicated an ethnic group in the forms are as follows: 78% indicated that they were 'White', 9% identified as 'Asian', 7% as 'Black', 5% as 'Mixed' and 1% as 'Other'.

Lastly, with regards to the level of deprivation that the women live in, OHID states that across different age groups and different regions of England 'women living in the most deprived areas of England are more than twice as likely to have abortions than women living in the least deprived areas.' [51] The rate varies between 27.5 per 1,000 women for the most deprived decile, to 12.6 per 1,000 women for women living in the least deprived areas.[52]

[50] See https://www.gov.uk/government/statistics/abortion-statistics-for-england-and-wales-2021 [accessed: 17 August 2022].
[51] https://www.gov.uk/government/statistics/abortion-statistics-for-england-and-wales-2021/abortion-statistics-england-and-wales-2021[accessed: 20 July 2022].
[52] https://www.gov.uk/government/statistics/abortion-statistics-for-england-and-wales-2021/abortion-statistics-england-and-wales-2021[accessed: 20 July2022].

3.7. Repeat abortions

Lewis et al. (2016, p. 16) note in the MSNA 2016, that 'repeat unintended pregnancy and subsequent abortion is a complex issue associated with increased age as it allows longer for exposure to pregnancy risks'. The proportion of women having repeat abortions (one or more previous abortions) has increased steadily in England and Wales from 36% in 2011 to 42.6 in 2021 (OHID, 2022b).[53] Nationally, it increased from 37.6% in 2013 (Lewis et al., 2016, p.16), to 42.6% in 2021 (see table 12, below). Whilst the percentage of women having repeat abortions in England and Wales remained consistent at 7% for women aged 18 and under in 2011 and 2021, the percentage for the over-30-year-olds increased from 46% in 2011 to 51% in 2021 (Office for Health Improvement and Disparities, 2022c).

Local data

OHID figures highlight the large variation across all local authorities in England and Wales in the proportion of women who had a repeat abortion in 2021; this ranged from 29% (City of London) to 53.5% (Knowsley). OHID adds that 'this variation could be due to a range of factors, including random variation, differing demographics or the impact of local policy decisions' (Office for Health Improvement and Disparities, 2022c).

Table 12, below, demonstrates the variation across the nine local authorities featured in this JSNA. As already noted, Knowsley had the highest percentage of repeat abortions, and seven further local authorities had percentages higher than the national average (42.6%). Only Cheshire East (39.7%) of and Cheshire West and Chester (41.7%) had a lower percentage. Furthermore, Knowsley also had the highest rate of repeat abortions in ages under 25 (39.2%), and also Halton, Liverpool, Sefton, St Helen's and Wirral had a higher percentage of repeat abortion in the under-25s than the national average. All local authorities with the exception of Cheshire East (46.0%) had a higher percentage than the national average (49.6%) in women aged 25 years and over who carried out repeat abortions. Knowsley had the highest percentage (61.2%).

Table 14: Repeat abortions per local authority (2021)

Local Authority	Percentage repeat abortions all ages	Percentage Repeat abortions in ages under 25	Percentage Repeat abortions in women aged 25 and over
Cheshire East	39.7	28.5	46
Cheshire West and Chester	41.7	26.7	50.5
Halton	46.2	30.4	56.3
Warrington	42.7	29.6	51.5
Knowsley	53.5	39.2	61.2
Liverpool	46.6	33.7	56.3
Sefton	45.2	34.2	51.7
St. Helens	46.0	33.4	53.9

[53]Figures for England are not separately available for 2011. See Abortion statistics: England and Wales 2011 - GOV.UK (www.gov.uk) [accessed: 18 August 2022].

Wirral	48.5	38.1	56.0
England	42.6	29.7	49.6

Sources: Office for Health Improvement & Disparities, 'Abortion statistics for England and Wales 2021'.[54]

4. Antenatal period

4.1. Influenza vaccine amongst pregnant women

The NHS seasonal influenza vaccination programme aims to protect clinical risk groups, as well as pregnant women, those aged 65 years and over, and those with a body mass index (BMI) of 40 or more from the higher risk of morbidity and mortality should they develop the flu (UK Health Security Agency, 2022a, p.7). A flu vaccination programme has also been phased in for healthy children since 2013, 'because offering influenza vaccine to healthy children not only provides individual protection to the child, it also reduces transmission across all age groups to lessen levels of flu activity overall and reduces the burden of flu across the population (UK Health Security Agency, 2022a, p.7).

Flu infections have been linked to several possible complications for pregnant women and infants (UK Health Security Agency, 2022a, p.15).[55] For infants, these include perinatal mortality, prematurity, low birth weight and smaller neonatal size (e.g. McNeil et al., 2010; Pierce et al., 2011). For pregnant women, these include a higher chance of developing flu-related complications, especially in late pregnancy, such as bronchitis and pneumonia.[56] Contracting flu has also been linked to maternal deaths, and therefore Mothers and Babies: Reducing Risk through Audits and Confidential Enquiries across the UK reports (MBRRACE-UK) highlight that preventing flu in pregnant women is one important factor in preventing deaths (Knight et al., 2014; Knight et al., 2015).[57] All in all, contracting the flu carries a greater risk of severe infections for both the infant and pregnant woman, with an increased likelihood of needing intensive care (UK Health Security Agency, 2022a, p.15, also see Vousden et al. 2021).Therefore, the UK Health Security Agency states that all pregnant women, regardless of their stage of pregnancy, should be offered the flu vaccine including those who become pregnant during the flu season(UK Health Security Agency, 2022, p.15).

Nationally, the vaccine uptake for GP registered pregnant women for the season 2021-2022 (1 September 2021 to 28 February 2022) was 37.9%.[58] This was a decrease from 43.6% in 2020-2021 and 43.7% in 2019-2020. Data for women in a clinical risk groups were not

[54] See https://www.gov.uk/government/statistics/abortion-statistics-for-england-and-wales-2021 [accessed: 17 August 2022].

[55]For studies on complications and mortality of pregnant women see Neuzil et al. (1998) and Pebody et al. (2010).

[56]See https://www.nhs.uk/pregnancy/keeping-well/flu-jab/ [accessed: 8 September 2022].

[57]As Lewis et al. (2016, p.18)have noted in MSNA 2016, MBRRACE 'found that 1 in 11 of the 357 women who died during, or within six weeks of the end of their pregnancy in the UK in 2009-12 died from flu – more than half of these deaths could have been prevented by a flu jab'.

[58]See https://www.gov.uk/government/statistics/seasonal-flu-vaccine-uptake-in-gp-patients-monthly-data-2021-to-2022 [accessed: 21 August 2022].

available separately for 2021-2022, but there had been an increase in uptake for this group from 56.9% during the season 2019-2020 to 57.7% in 2020-2021.[59]

Local data

Whilst the MSNA 2016 recorded that all nine local authorities had an uptake of the influenza vaccine for pregnant women that was above the national average (44.1%) for the year 2013-2014 (Lewis et al., 2016), the table below shows a mixed picture for the vaccination uptake in pregnant women for 2020-2021. Only two local authorities had an uptake higher than the national average: Cheshire East (44.4%) and Cheshire West and Chester (38.2%). Liverpool had the lowest uptake with 28.5% of pregnant women vaccinated, followed by Knowsley (30.2%) and Halton (31.6%).

Table 15: Uptake of influenza vaccine in pregnant women by local authority (2021-2022)

Local Authority	Total GP registered Pregnant women	Pregnant women vaccinated	Percentage of vaccinated pregnant women
Cheshire East	4,468	1,984	44.4
Cheshire West and Chester	4,039	1,542	38.2
Halton	1,584	500	31.6
Warrington	1,329	500	37.6
Knowsley	1,962	593	30.2
Liverpool	6,992	1,990	28.5
Sefton	2,620	978	37.3
St. Helens	2,055	770	37.5
Wirral	3,399	1,225	36.0
England	645285	244,629	37.9

Source: UK Health Security Agency. 'Official Statistics: Seasonal flu vaccine uptake in GP patients: monthly data, 2021 to 2022'.[60]

4.2. Prenatal pertussis (whooping cough) vaccine for pregnant women

A national immunisation programme against pertussis was introduced in the UK in1957, leading to a decline in the circulation of the disease and associated deaths. However, despite a 'high vaccine coverage since the early 1990s, the disease has continued to display several yearly peaks in activity' (Lewis et al., 2016, p.19). Pertussis circulation saw a high peak in 2012, with the highest number of cases recorded in two decades. Many cases were in young adults and adolescents, but infants under three months were most at risk, with the highest levels of morbidity and mortality occurring in this age group (UK Health Security

[59] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/996033/Annual-Report_SeasonalFlu-Vaccine_GPs_2020_to_2021.pdf [accessed: 21 August 2022].
[60] https://www.gov.uk/government/statistics/seasonal-flu-vaccine-uptake-in-gp-patients-monthly-data-2021-to-2022 [accessed: 21 August 2022].

Agency, 2021, p.4).[61] As a response to this outbreak, the Department of Health introduced a temporary vaccination programme for pregnant women. Due to its high acceptance and its effectiveness in preventing the disease in very young infants, the emergency programme was extended in 2014.In 2019, the Joint Committee on Vaccination and Immunisation recommended that it continue as a routine programme (see UK Health Security Agency, 2021, p.4).[62]

The UK Health and Security Agency advises pregnant women to get vaccinated between weeks 16 to 32 of pregnancy, noting that 'the vaccine is sometimes offered after the mid-pregnancy scan around 18 to 20 weeks'.[63] The Agency explains that vaccinating pregnant women in this time window ensures 'that high levels of antibodies against pertussis cross the placenta from the mother to protect the baby passively when it is born'.[64] Whilst women can still be immunised after week 32 of pregnancy and up to birth, 'this may not offer as high a level of passive protection to the baby, particularly if they are born pre-term' (UK Health Security Agency, 2021, p.7).

The UK Heath Security Agency reports that the national vaccination coverage for pregnant women has been around 70% since 2016(UK Health Security Agency, 2021, p.5). This is a significant increase from 56.4%recorded for the year 2013-2014 in the MSNA 2016 (Lewis et al., 2016, p.18). As will be discussed below, there has nevertheless been a slight drop in the vaccination coverage since 2019, which is most likely linked to the impact of the Covid-19 pandemic. The annual vaccine coverage for the period from April 2021 to March 2022was 64.7%, 3.1 percentage points lower compared to the percentage recorded for 2020 to 2021 (67.8%) and5.8 percentage points lower compared to the 2019 to 2020 (70.5%) (UK Health Security Agency, 2022b). The UK Health and Security Agency adds that 'this observed decline in coverage has largely been driven by a decrease in London NHS Commissioning Region which had coverage that was 12.9 percentage points lower in March 2022 [45.3%] as compared to March 2020' (UK Health Security Agency, 2022b).

The Agency also reported that in the fourth quarter of the reporting year 2021-2022 (January to March 2022) vaccine coverage was 64.0% and thus lower than any previous quarter since April 2016(UK Health Security Agency, 2022b). The Agency attributes the

[61]As the UK Health Security Agency (2021, p.4) states, 'in those infants less than 3 months old, the incidence of laboratory confirmed cases of pertussis was 240 per 100,000 in 2012 with a total of 14 infant deaths reported in England and Wales'. The UK Health Security Agency explains that babies under one year of age are particularly at risk from the disease. While they do not always display the characteristic coughing and breathing difficulties triggered by the disease, which therefore makes it difficult to recognise, it can lead to pneumonia, permanent brain damage, or death in the worst case. See https://www.gov.uk/government/publications/resources-to-support-whooping-cough-vaccination/whooping-cough-vaccination-in-pregnancy-guide [accessed: 8 September 2022].

[62] See https://app.box.com/s/iddfb4ppwkmtjusir2tc/file/492419147748 [accessed: 8 September 2022]. The UK Health and Security Agency notes that 'although the number of deaths has decreased in babies born since introducing the vaccination programme 8 years ago in England, 20 babies died with confirmed pertussis during this time' (2021, p.6).

[63]https://www.gov.uk/government/publications/resources-to-support-whooping-cough-vaccination/whooping-cough-vaccination-in-pregnancy-guide [accessed: 8 September 2022].

[64]https://www.gov.uk/government/publications/vaccination-against-pertussis-whooping-cough-for-pregnant-women [accessed: 8 September 2022].

possible cause to 'the continuation of the COVID-19 pandemic and its impact on healthcare services' (UK Health Security Agency, 2022b).

Local data (STP level)

The UK Heath Security Agency has also reported a significant regional variation in vaccine coverage. Whilst data are not available at local authority level, the Agency collates the data at the level of Sustainability and Transformation Partnerships (STP), Local Team or NHS Regional Team. In this JSNA we have chosen to look at the data at STP level. For the period of January to March 2022, the difference between the highest and lowest STP mean coverage was 48.2 percentage points. Shropshire and Telford and Wrekin had an average of 80.7% coverage and North London Partners in Health and Care an average of 32.5%.[65] The STP Cheshire and Merseyside covering the Local Authorities featured in this JSNA had lower vaccination rates for that quarter (62.3%) than the national average (64%). The STP also had a lower than the national average (64.7%) vaccine coverage for the year April 2021 to March 2022 (63.1%).[66]

4.3. Sickle cell and infectious disease monitoring

Table 16 shows data for antenatal screening key performance indicators (KPI) made available by NHS England for the fourth quarter of the reporting year 2021 to 2022.[67] NHS England (2022) notes that as 'data covers the time period through the COVID-19 pandemic [...] Provider performance should [...] be interpreted with caution. In addition to this, some providers were justifiably not able to make timely data returns or validate their data in this period'.

Local data

With regards to national performance of ID1 HIV Test Coverage, this was 99.8%. NHS England (2022) notes that whilst ID1 performance has remained above the achievable threshold of 99% since 1 April 2018, this was at the highest ever level recorded for this KPI. All local Trusts performed above the achievable threshold of 99%. In terms of ID2 Timely Referral of Hepatitis B Positive Women for Assessment, national performances (83.2%), as well as the performance in the North West (84.4%), were above the acceptable threshold of 70%.

[65] https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fassets.publishing.service.gov.uk%2Fgovernment%2Fuploads%2Fsystem%2Fuploads%2Fattachment_data%2Ffile%2F1097985%2Fpertussis-backing-tables-Q4.ods&wdOrigin=BROWSELINK [accessed: 8 September 2022].

[66] https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fassets.publishing.service.gov.uk%2Fgovernment%2Fuploads%2Fsystem%2Fuploads%2Fattachment_data%2Ffile%2F1097985%2Fpertussis-backing-tables-Q4.ods&wdOrigin=BROWSELINK [accessed: 8 September 2022].

[67] Please find the dataset 'Antenatal and newborn screening KPI data: Q4 (1 January to 31 March 2022)' here: NHS screening programmes: KPI reports 2021 to 2022 - GOV.UK (www.gov.uk) [accessed: 5 October 2022].

Table 16: Screening for Sickle Cell, Thalassaemia, HIV Hepatitis B referral (2021-2020, Q4, January to March 2022) (%)

Screening Service	ST1 - Antenatal Sickle Cell and Thalassaemia Coverage (Target 99%)	ST2 - Antenatal Sickle Cell and Thalassaemia Timeliness of Test (Target 75%)	ST3 – Antenatal Sickle Cell and Thalassaemia Completion of Family Origin Questionnaire (Target95%)	ID1 HIV Test Coverage (Target 90%)	ID2 Timely Referral of Hepatitis B Positive Women for Assessment (Acceptable 70%, Target 90 %)*
Cheshire					
Countess of Chester Hospital NHS Foundation Trust	No return	No return	No return	No return	-
East Cheshire NHS Trust	100	72.3	98.4	100	-
Mid Cheshire Hospitals NHS Foundation Trust	99.7	69.6	99.8	99.8	-
Warrington and Halton Teaching Hospitals NHS Foundation Trust	99.6	45.6	94.2	99.9	-
Merseyside					
Liverpool Women's NHS Foundation Trust	99.8	45.8	93.7	99.7	-
Southport and Ormskirk Hospital NHS Trust	100	47.9	98.4	100	-
St. Helens and Knowsley Teaching Hospitals NHS Trust	98.5	61.5	94.6	99.1	-
Wirral University Teaching Hospital NHS Foundation Trust	100	12.8	97.7	99.7	-
North West	99.8	50.7	96.4	99.8	84.4*
England	**99.7**	**55.5**	**97.8**	**99.8**	**83.2**

Source: NHS England (2022) 'Antenatal and newborn screening KPI data: Q4 (1 January to 31 March 2022)'. [68] *Due to the small number of patients, quarterly data has been suppressed at local service level in order to protect patient confidentiality and will be published annually.

4.4. Women with complex needs/ complex social factors during pregnancy

Women with complex social factors who are pregnant may have additional needs and require extra support in order to reduce risks for mother and infant. Complex social factors in pregnancy may include: poverty, homelessness, substance misuse, recent arrival as a migrant; asylum seeker or refugee status, difficulty speaking or understanding English, age

[68] Please find the dataset 'Antenatal and newborn screening KPI data: Q4 (1 January to 31 March 2022)' here: NHS screening programmes: KPI reports 2021 to 2022 - GOV.UK (www.gov.uk) [accessed: 5 October 2022].

under 20, suffering from domestic abuse, or mental health problems (NICE, 2010). Successive MBRRACE-UK (e.g. 2014; 2015; 2021) reports have also highlighted that women with complex social (and /or physical) needs are more likely to suffer morbidity and mortality linked to pregnancy and birth. In their most recent report, MBRRACE-UK summarise that 'eight percent of the women who died during or up to a year after pregnancy in the UK in 2017-19 were at severe and multiple disadvantage. The main elements of multiple disadvantage were a mental health diagnosis, substance use and domestic abuse' (Knight et al., 2021, p.iii). As complex social factors may vary across different local populations in type and prevalence, the NICE (2010) guideline [CG110] states that complex factor groups and 'the number of women within each complex social factor grouping [should be] identified locally'.[69]

The most current data with regards to women who attended a booking appointment and had complex social factors recorded is available from the Maternity Services Monthly Statistics (published 27 October 2022) for 1 to 31 July 2022. Nationally, 7,385 women (14%) attending a booking appointment had complex social factors recorded and 46,160 had no complex social factors.[70]

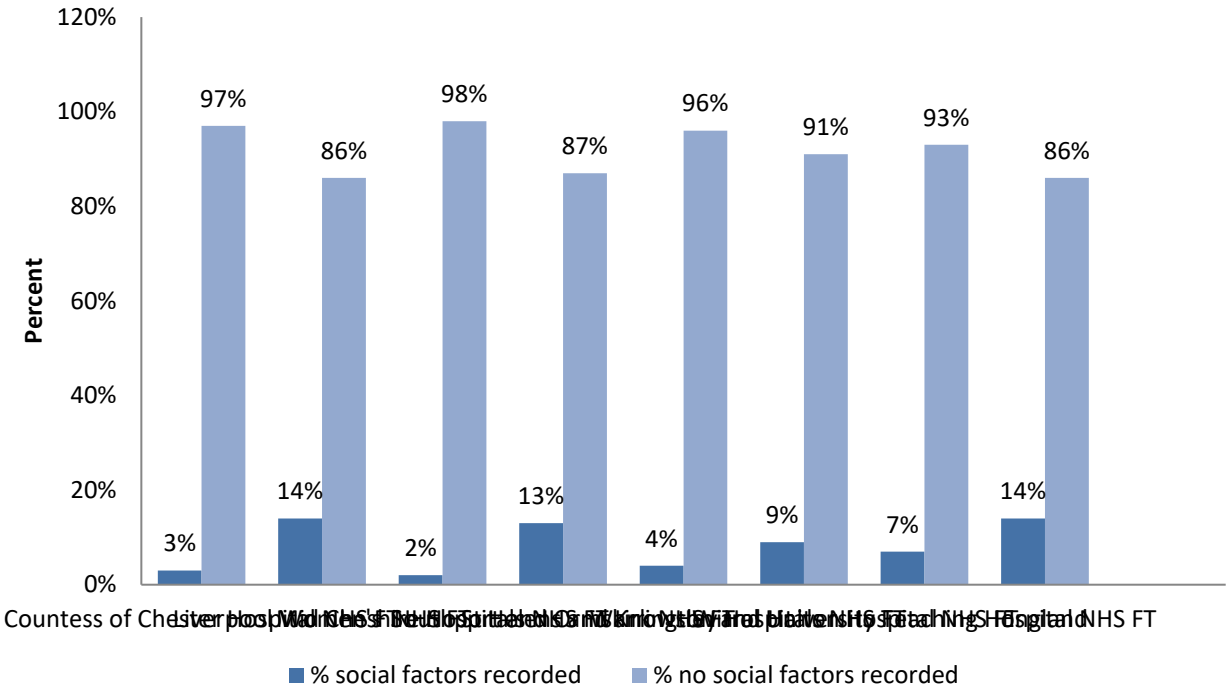
Local data

Graph 10 contains the corresponding data for the local Trusts. Liverpool Women's Hospital had the highest amount of women recorded with complex social factors (14%), equal to the national average. All other localities had percentages that were lower than the national average. Mid Cheshire Hospital Foundation Trust had the lowest percentage of women recorded to have complex social factors at the time of their booking appointment (2%).

[69] Additionally, commissioners should ensure that the following indicators to be recorded for each grouping: 1) the number of women who attend for booking by 10, 12+6 and 20 weeks. 2) The number of women who attend the number of antenatal appointments. 3) Levels of mortality, or significant morbidity (i.e. a lasting impact on either the women or the child), of women and babies. 3) The number of appointments each woman attends. 4) The number of scheduled appointments each woman does not attend Further, women with complex social factors who present for antenatal care should be asked about their satisfaction with the services provided and the women's responses should be recorded and monitored. This should then be used to guide service development (NICE, 2010).

[70] Find the Maternity Services Monthly Statistics (July 2022) here:https://digital.nhs.uk/data-and-information/publications/statistical/maternity-services-monthly-statistics/july-2022-experimental-statistics [accessed: 1 November 2022].

Graph 10: Complex Social Factors by Trust (%) (July 2022)



Source: NHS Digital (2022), 'Maternity Services Dashboard', based on Maternity Services Monthly Statistics for July 2022 .[71]

4.5. Timing of booking appointments

So that women's health needs, risk factors and preferences can be recorded and inform strategies for their care, NHS information pages ask women to contact their GP or midwife promptly after having found out that they are pregnant. Such appointments are normally arranged for between 8-12 weeks of pregnancy, in line with 'early' booking appointments by 10 weeks 0 days recommended by NICE (also see NICE, 2012, p.7)and encouraged by NHS England.[72]Booking later in pregnancy has been identified as a risk factor for all women, but particularly black and minority ethnic women, by successive reports into Maternal Mortality (e.g. Lewis, 2008; Lewis, 2011; Knight et al., 2014; Knight et al., 2015; Public Health England, 2019c).[73] Additionally, screening for sickle cell and thalassaemia, should be done before women are 10 weeks pregnant.[74]

[71]Find the Maternity Services Dashboard here: Microsoft Power BI [accessed: 1 November 2022].
[72]For example see: https://www.nhs.uk/pregnancy/your-pregnancy-care/your-antenatal-appointments/ or https://www.nhs.uk/pregnancy/finding-out/your-first-midwife-appointment/ [accessed: 5 September 2022].
[73]Several definitions of 'early' and 'late booking' circulate in the literature. Different definitions of late booking range from booking after 16–22 weeks of gestation(Haddrill et al., 2014). In their study, Haddrill et al. (2014) define late booking as 'first hospital antenatal attendance at 20 or more weeks gestation'. OHID (2020) defines 'early access to maternity care' as having the booking appointment with a midwife within 10 completed weeks of their pregnancy. Historically, the Department of Health and NHS England monitored the proportion of women who had seen their midwife within12 weeks plus six days (Office for Health Improvement and Disparities, 2020).
[74] See https://www.nhs.uk/pregnancy/your-pregnancy-care/your-antenatal-appointments/ [accessed: 5 September 2022].

In their analysis of data from the Maternity Services Dataset (MSDS) recorded at booking appointments January to December 2017, Public Health England(2019c, pp.8-9) found that more than half of pregnant women (53.9%) attend their booking appointment within 10 weeks. A further28.7% booked between 10-12 weeks, 9.3% within 13-20 weeks, and 8.1% of pregnant women booked at gestational age of 20 weeks or more.

PHE found a variation according to age, level of deprivation in which women lived, and ethnic background. Women under 25 years of age tended to attend antenatal care later, with a fifth of women attending when they were 13 weeks of gestation or more, whilst women in their mid-twenties and early thirties were most likely to attend their antenatal booking appointment within 10 weeks (55.7%). Moreover, PHE found a clear correlation between levels of deprivation in which women lived and early booking (within the ten weeks) – with early booking more likely among women living in lower levels of deprivation. Whilst 48.9% of women living in the most deprived areas attended their booking appointment after the recommended 10 weeks, the percentage of women in the least deprived areas was 41.1%.Finally, the ethnic groups most likely to book after 10 weeks were black women (61.5%) and women whose ethnicity was given as 'other' (58.6%) (Public Health England, 2019c, pp.8-9, 102). However, these findings should not to be taken to reinforce socio-cultural stereotypes of groups of women who tend to book 'early' or 'later'. As Haddrill et al. (2014) found in their qualitative study focusing on reasons for late booking among women, reasons are complex and 'many themes associated with late booking found in previous studies of marginalised women are evident amongst women across the social, educational and cultural spectrum [...]'(Haddrill et al., 2014, p.8).[75]

Local data

Out of all recorded births reported within the Hospital Episode Statistics (HES) between April 2018 and 31 March 2019, 61% of women had their first antenatal assessment between 8-11 weeks for that pregnancy (NHS Digital, 2019). For the ten Local Authorities included in this report, data are available through the Maternity Services Data Set for the year 2018/2019 (accessed via the Fingertips/Public Health Dataset).[76] The dataset provides numbers and percentages of pregnant women who had 'early access' to maternity care, i.e. who had their booking appointment with a midwife within 10 completed weeks of their pregnancy. Six out of the nine Local Authorities have percentages higher than the England average of 57.8% in terms of women accessing maternity care early. The Local Authority with the highest percentage of women recorded has having accessed maternity care early is Cheshire East (72.7%). Cheshire West and Chester (70.9%) and Sefton (68.8%) also have significantly higher percentages. Warrington (47.7%) and St. Helen's (55.7%) had lower

[75]Haddrill et al. (2014) found that the reasons for late booking provided by their cohort went beyond prevalent 'denial, concealment and disadvantage' concepts. They categorise explanations given by the women into the themes of 'psychological, empowerment, and socio-cultural factors', including poor knowledge of issues regarding reproductive health, previous experience of pregnancy, a pregnancy 'mindset', and 'the perceived value of antenatal care'. They also highlight 'deficiencies in early pregnancy diagnosis and service organisation' (2014: 207).

[76]Find Office for Health Improvement & Disparities Fingertips/ Public Health Data for indicators on Child and Maternal Health here: https://fingertips.phe.org.uk/profile/child-health-profiles/data#page/1/gid/1938133222 [accessed: 4 July 2022].

percentages, and Halton the lowest with 44.4%. Breakdowns are not currently available according to ethnicity or age groups with regards to these local data.

Table 17: Booking appointment within 10 weeks by Local Authority, 2018/2019

Local Authority	Number	Percentage
Cheshire East	2,895	72.7
Cheshire West and Chester	2,515	70.9
Halton	730	44.4
Warrington	1,090	47.7
Cheshire	*7,230*	
Knowsley	1,215	59.7
Liverpool	3,880	64.9
Sefton	1,910	68.8
St. Helens	1,025	55.7
Wirral	1,680	61.4
Merseyside	*9,710*	
Cheshire & Merseyside LMS	*15,490*	*62.2*
England	**377,235**	**57.8**

Sources: Office for Health Improvement & Disparities, Fingertips/ Public Health Data, 'Child and Maternal Health:Early access to maternity care (2018/2019)'. Based on Maternity Services Dataset (MSDS) v1.5.

5. Birth

5.1. Total fertility rates

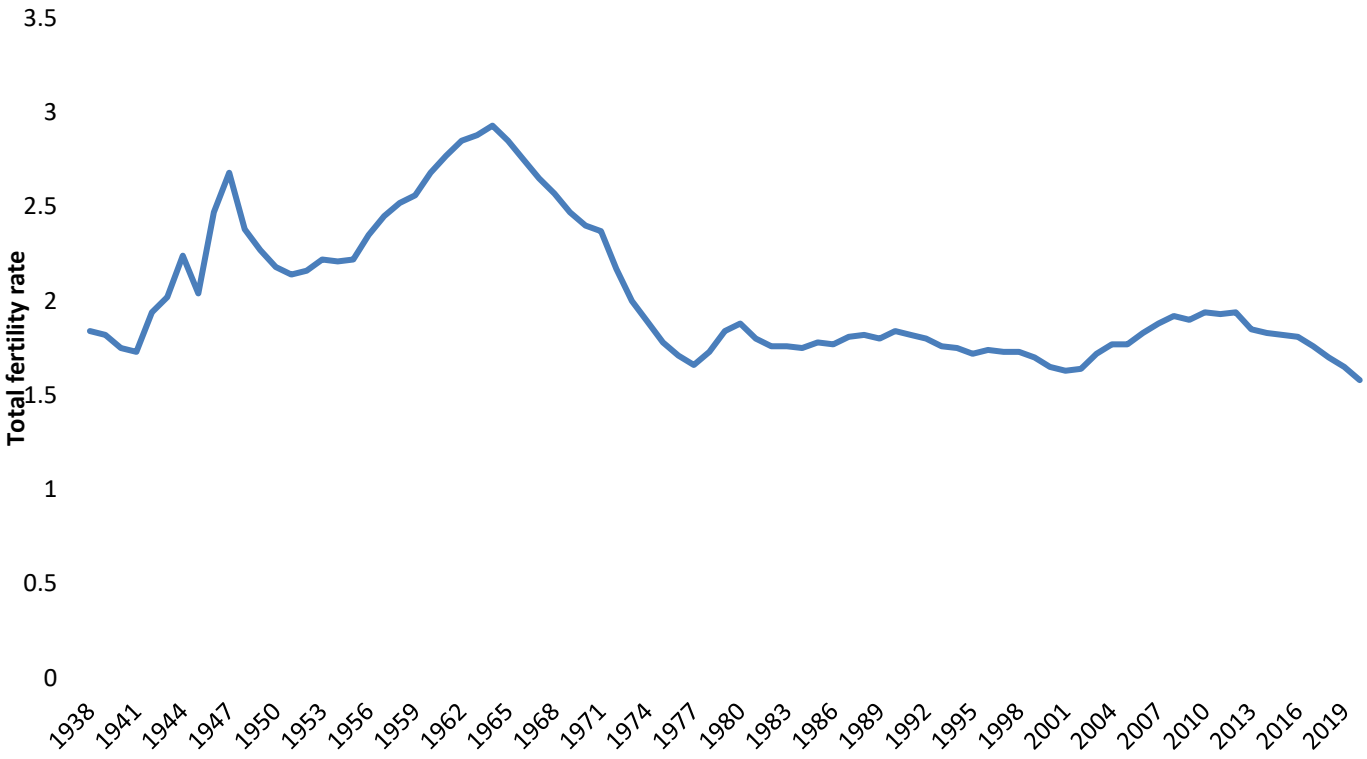
As the ONS (2021) summarises, the total fertility rate has remained below replacement level since 1973, and has experienced a year-on-year decrease since 2012 (see graph 11, below).[77] Reasons for this downward trend could include 1) improved access to contraception (the abortion act came into force in 1968, but fertility was already on the decline by that year), 2) a reduction in the under-5 infant mortality rate, leading to women having fewer babies, and 3) lower fertility levels, perhaps due to women choosing to have children later in life (Office for National Statistics, 2021, pp.3-4). For the year 2020, the total fertility rate for England and Wales fell to 1.58 children per woman, the lowest since the recordings began in 1938. This presented a drop of 4.2% from the level 2019 (1.65) and 3.1% lower than the previous record low in 2001 (1.63). However, a slight rise in the fertility to 1.61 in 2021 has seen the first break in this downward trend since 2012.[78] Nationally, the

[77] Total fertility rate = 'the average number of live children that a group of women would bear if they experienced the age-specific fertility rates of the calendar year throughout their childbearing lifespan' https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/livebirths/bulletins/birthsummarytablesenglandandwales/2020#other-birth-outputs-in-this-release [accessed: 21July 2022].

[78] See 'Births in England and Wales: summary tables', 2021 Edition: https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/livebirths/datasets/birthsummarytables [accessed: 13 September 2022].

total fertility rate decreased from 1.66 in 2019 to 1.59 children per woman in 2020 (a 4.2% decrease),[79] before rising again in 2021 to 1.62.

Graph 11: Total fertility rate, England and Wales (1938-2020)



Source: Office for National Statistics (2021), 'Conceptions Births in England and Wales: 2020. Live births, stillbirths and the intensity of childbearing, measured by the total fertility rate '.[80]

[79] https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/livebirths/bulletins/birthsummarytablesenglandandwales/2020#other-birth-outputs-in-this-release [accessed: 21 July 2022].
[80] https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/livebirths/bulletins/birthsummarytablesenglandandwales/2020#other-birth-outputs-in-this-release [accessed: 21 July 2022].

Local data

Table 18 below shows the change in fertility rate between from 2014 (as a comparator to the MSNA 2016), 2019, 2020 and 2021 for the nine Local Authorities. In 2014, the local authority areas with the highest rates were Halton at 1.94 and Knowsley at 1.93. The local authority area with the lowest rate was Liverpool (1.62). By 2019 all local authorities had experienced a drop in fertility rates in comparison to the 2014 figures. In 2020, eight out of the nine local authorities had experienced a further drop in total fertility rates, with the exception of St. Helens where the rate had slightly increased. In 2021, however, fertility rates rose again in all but two local authorities. In Warrington the rate dropped from 1.56 to 1.54 and it remained the same in St. Helens (1.63). The local authority with the lowest total fertility rate continued to be Liverpool (1.38). Cheshire East (1.90) had the highest total fertility rate, followed by Knowsley (1.89).

Table 18: Total fertility rate by Local Authority (2014, 2019, 2020, 2021)

Local Authority	2014	2019	2020	2021*
Cheshire East	1.87	1.82	1.72	1.90
Cheshire West and Chester	1.82	1.69	1.64	1.65
Halton	1.94	1.73	1.55	1.70
Warrington	1.84	1.67	1.56	1.54
Knowsley	1.93	1.87	1.70	1.89
Liverpool	1.63	1.44	1.34	1.38
Sefton	1.86	1.71	1.59	1.66
St. Helens	1.83	1.61	1.63	1.63
Wirral	1.91	1.71	1.60	1.65
England	***1.83***	***1.66***	***1.56***	***1.62***

*Source: Office for National Statistics (2021) and*Office for National Statistics (2021) 'Births in England and Wales: summary tables'.*[81]

The age specific fertility rates for England and Wales also decreased across all age groups in 2020 compared to the previous year, including for women aged 40 and over (see graph 12, below).[82] The rate for women over 40 had generally seen a steady increase since the 1970s (with a minor drop in 2013), but in 2020 the rate dropped to 16.0 per 1,000 live births from 16.5 in the previous year, rising again to 16.2 in 2021.[83] Following a gradual increase since

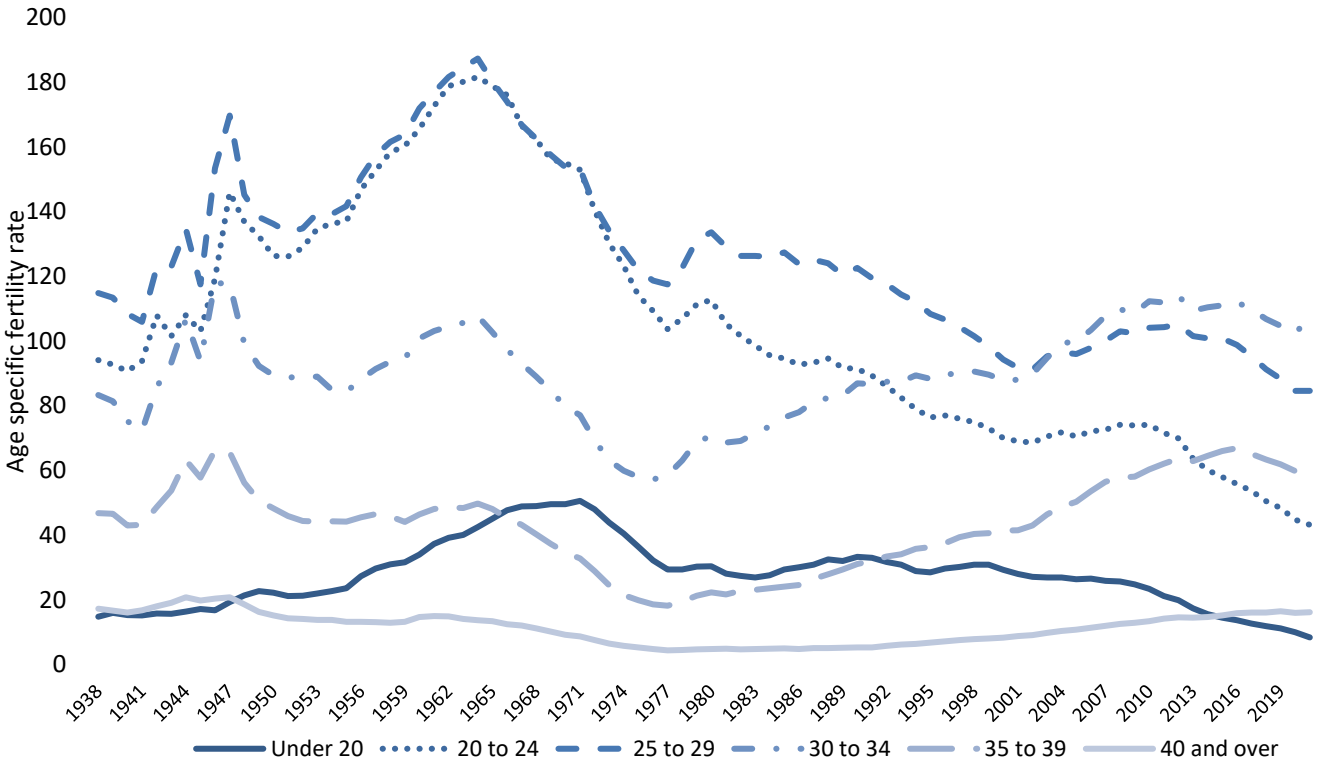
[81] https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/livebirths/bulletins/birthsummarytablesenglandandwales/2020#other-birth-outputs-in-this-release [accessed: 21 July 2022] and 'Births in England and Wales: summary tables', 2021 Edition: https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/livebirths/datasets/birthsummarytables [accessed: 13 September 2022].

[82] Age Specific Fertility rate = 'The number of live births to mothers of a particular age per 1,000 women of that age in the population' https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/livebirths/bulletins/birthsummarytablesenglandandwales/2020#other-birth-outputs-in-this-release [accessed: 21 July 2022].

[83] See 'Births in England and Wales: summary tables', 2021 Edition: https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/livebirths/datasets/birthsummarytables [accessed: 13 September 2022].

1973, the average age of mothers at childbirth remained the same in 2020 as in the previous year (30.7 years).

Graph 12: Age Specific Fertility Rate, England and Wales, 1938-2021



Source: Office for National Statistics (2021), 'Births in England and Wales: Summary Tables'.[84]

5.2. General fertility rates

According to the Office for National Statistics(2021, p.3), in 2020 the number of live births for England and Wales decreased for the fifth consecutive year (to 613,936). The ONS notes further that this is the lowest since 2002, and that since the most recent peak in 2012, the number of live births dropped by 15.9%.Nationally, there were 585,195 live births in the UK, and the general fertility rate per 1,000 population aged 16-44 was 55.3.[85]

Local data

Table 19, below, shows that in 2020 the local authority area with the highest general fertility rate (61.4) was Knowsley (1,807 live births for women aged 15-44), followed by St. Helens (57.1) and Cheshire East (57.0). Liverpool had the lowest general fertility rate with 46.2 live births per 1,000.

[84] 'Births in England and Wales: summary tables', 2021 Edition: https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/livebirths/datasets/birthsummarytables [accessed: 13 September 2022].

[85] General Fertility Rate = 'The number of live births in a year per 1,000 women aged 15 to 44 years' https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/livebirths/methodologies/userguidetobirthstatistics#glossary [accessed: 8 November 2022].

Table 19: General fertility rate 2020 (women 15-44)

Local Authority	Number	Live births per 1,000 in age group
Cheshire East	3,462	57.0
Cheshire West and Chester	3,255	55.5
Halton	1,256	52.9
Warrington	1,945	53.2
Cheshire	*9,918*	-
Knowsley	1,807	61.4
Liverpool	5,183	46.2
Sefton	2,405	54.4
St. Helens	1,822	57.1
Wirral	2,958	54.1
Merseyside	*14,175*	-
Cheshire & Merseyside LMS	*24,093*	*53.3*
England	***585,195***	***55.3***

Sources: Office for Health Improvement & Disparities, Fingertips/ Public Health Data, 'Child and Maternal Health: General fertility rate (2020)' . Based on ONS 2020 data.

5.3. Age of mother at time of birth (as a proportion of live births)

Maternal age at either end of the spectrum has been identified as a risk factor in pregnancy. One the one hand, advanced maternal age is considered a risk factor in the chance adverse outcomes for both, mother and child (e.g. The Royal College of Midwives, 2018, p.5).[86] As Glick et al. (2021, p.751) summarise, among possible compilations for mothers are 'gestational diabetes mellitus (GDM), gestational hypertension (HTN), and caesarean birth. Detrimental perinatal outcomes include higher rates of chromosomal abnormalities, miscarriage, pre-term labour, neonatal intensive care unit (NICU) admissions, and stillbirth'(The Royal College of Midwives, 2018, p.5). Whilst not true for every case, the Royal College of Midwives summarises that 'older women will typically require more care during their pregnancy and postnatally. ... [which adds] to the mix of complexity with which maternity services must cope' (2018, p.5). On the other hand, maternal age under 20 years is a considered a risk factor when it comes to neonatal and infant and neonatal mortality (see section 6.3 'Infant mortality', below).

The age-specific fertility rates for women 30 and above saw a general rise between 2001 and 2020, whilst the rates for women and girls aged 29 and below have fallen.[87] Between 2001 and 2021, the yearly number of babies born to women over 40 in England and Wales

[86]In a recent review of literature reporting on studies of the risks related to advanced maternal age (AMA), Glick et al. (2021) point out that there is 'no standardized definition of AMA, one common definition is of maternal age above 35. Beyond that, maternal age above 40 is considered very advanced maternal age (VAMA), and above 45, very late maternal age\extremely advanced maternal age (EAMA)' (Glick, Kadish and Rottenstreich, 2021, p.751).

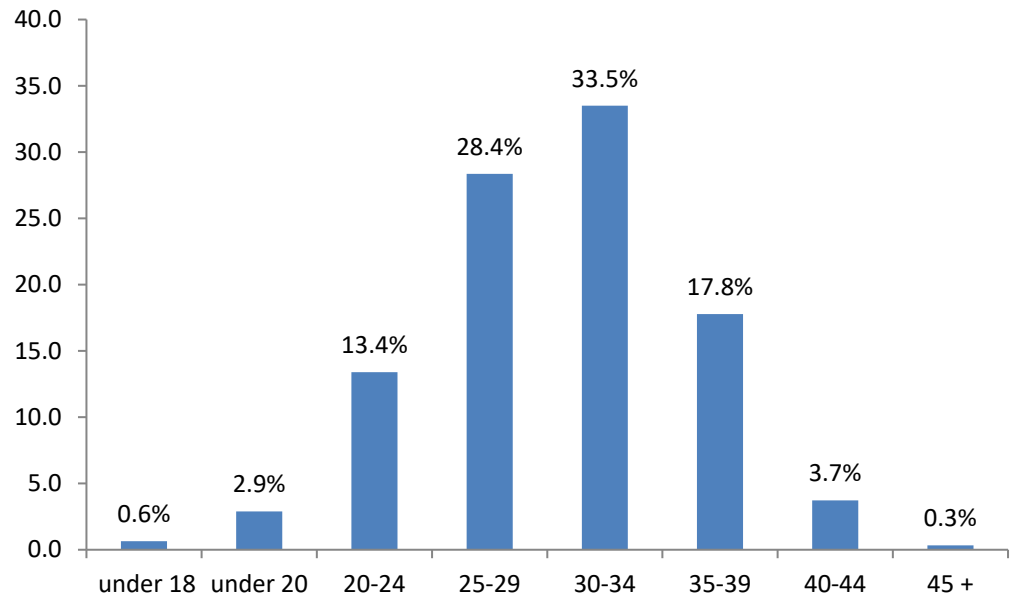
[87]Seehttps://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/livebirths/bulletins/birthsummarytablesenglandandwales/2020#other-birth-outputs-in-this-release [accessed: 21 July 2022].

nearly doubled from 16,260 to 30,542. During this time, the age-specific fertility rate for this group increased from 8.8 per 1,000 women in the age group to 16.2.[88] In the same period the number of babies born to women and girls under 20 more than halved (from over 44,000 to 13,738). The age-specific fertility rate decreased by nearly two-thirds from 28 per 1,000 women in the age group in 2001 to 8.4 per thousand in 2021.[89]

Local data

Graph 13 below shows the percentages of women who gave birth in different age groups across Merseyside and Cheshire for 2020. This clearly demonstrates that women aged 30-34 made up the largest percentage of all women giving birth across the region in 2020 (33.5%). Table 20 shows the full breakdown of percentages by local authority district and age for 2020. In terms of births to mothers over the age of 45, all areas had percentages lower, or equal to the national average (0.4%). St. Helen's was the area with the highest proportion of births to mothers under the age of 18, 1.3% compared to the national average of 0.6%. This was however a drop of 0.8% from the percentage recorded for 2013-2014 in the MSNA 2016 (2.1%) (Lewis et al., 2016, p.22). In line with the MSNA, Cheshire East had the lowest percentage (0.3%), a further drop of 0.8% from 2013-2014 (Lewis et al., 2016, p.22).

Graph 13: Age at birth for females resident in Merseyside and Cheshire, 2020 (Percent)



Source: NOMIS, 'Live births in England and Wales down to local authority local area' (2020).[90]

[88] See 'Births in England and Wales: summary tables', 2021 Edition: https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/livebirths/datasets/birthsummarytables [accessed: 13 September 2022].
[89] See 'Births in England and Wales: summary tables', 2021 Edition: https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/livebirths/datasets/birthsummarytables [accessed: 13 September 2022].
[90] https://www.nomisweb.co.uk/query/construct/summary.asp?mode=construct&version=0&dataset=205 [accessed: 12 September 2020].

Table 20: Age at birth for females by local authority(2020)

Local Authority	Total	under 18 (%)	under 20 (%)	20-24 (%)	25-29 (%)	30-34 (%)	35-39 (%)	40-44 (%)	45+ (%)
Cheshire East	3,462	0.3	1.9	11.3	28.2	34.4	19.3	4.3	0.4
Cheshire West and Chester	3,255	0.8	2.7	11.8	28.2	33.2	19.7	4.1	0.2
Halton	1,256	0.8	4.5	15.8	29.3	30.7	16.8	2.7	0.2
Warrington	1,945	0.7	2.6	12.0	27.6	34.2	19.0	4.4	0.3
Knowsley	1,807	0.8	2.4	15.9	32.2	33.2	14.1	1.9	0.3
Liverpool	5,183	0.6	2.7	14.0	28.6	33.3	17.4	3.7	0.4
Sefton	2,405	0.6	2.5	11.1	26.2	36.5	18.9	4.4	0.4
St. Helens	1,822	1.3	5.0	15.9	29.5	31.9	14.5	3.0	0.2
Wirral	2,958	0.5	3.3	15.3	27.1	32.6	17.5	3.8	0.4
England	585,195	0.6	2.5	12.8	26.7	33.6	19.4	4.5	0.4

Source: NOMIS, 'Live births in England and Wales down to local authority local area' (2020).[91]

5.4. Birth in different birth settings

Over the years there have been evidence-based initiatives to promote choice in birthplace (e.g. Birthplace in England Collaborative Group, 2011) and it is current national policy in England to support such choice. The NICE guidelines on 'Intrapartum care for healthy women and babies' (NICE, 2022c) recommend that women should be advised that they can give birth in any birth setting (i.e. home, freestanding midwifery unit (FMU), alongside midwifery unit (AMU) or obstetric unit) and that they should be supported in their choices. Further, NICE (2014) notes that low-risk women who have had previous births and who wish to give birth at home or in a midwifery led unit (freestanding or alongside) should be advised that this is 'particularly suitable for them because the rate of interventions is lower and the outcome for the baby is no different compared with an obstetric unit' (NICE, 2022c). And further, low-risk women who have had no previous births and plan 'to give birth in a midwifery led unit (freestanding or alongside) [should be told that this] is particularly suitable for them because the rate of interventions is lower and the outcome for the baby is no different compared with an obstetric unit' (NICE, 2014). NICE adds that with regards to planning a homebirth, however, this group should be advised that 'there is a small increase in the risk of an adverse outcome for the baby'(NICE, 2014).

Despite these recommendations, the majority of women continue to give birth in hospitals. Studies suggest that women (as well as healthcare professionals) perceive birth in a hospital environment as 'normal' and 'safer' (see Houghton et al., 2008; Coxon, Sandall and Fulop, 2013; Walsh et al., 2020). Moreover, whilst birth in MUs has in recent years been promoted (e.g. The Royal College of Midwives, 2014)and there has been an increase in the provision of AMUs and FMUs since 2010 (Walsh et al., 2018), they are not equally distributed over the

[91] https://www.nomisweb.co.uk/query/construct/summary.asp?mode=construct&version=0&dataset=205 [accessed: 12 September 2020].

country. In 2013, a third of NHS Trusts had no MUs, 'and those that did, were frequently underutilised with less than 10% of all births occurring in them'(Walsh et al., 2020, p.2).

In a recent study focusing on factors influencing the (under-) utilisation of FMU's and AMUs in England, Walsh et al. (2020) found that reasons included a lack of knowledge about the possibilities and advantages of births in these settings by pregnant women and practitioners, as well as managerial and staffing issues (Walsh et al., 2020, p.2).This therefore highlights 'the importance of accurate information for women on birth place and addressing misconceptions among both women and health care professionals' (Lewis et al., 2016, p.23).However, it is likely that women will increasingly be able to exercise informed choice as they base their decisions on a variety of information sources (friends, online resources and forums etc), whilst midwives continue to play a key role (see Hinton et al., 2018).

Local data

Table 21 below shows births by setting and NHS Trusts covering the Local Authorities featured in this JSNA. It is important to note that the number of births recorded for each setting are linked to the level of the maternity provision in each of the Trusts. For instance, Liverpool Women's Hospital has a level three Neonatal Intensive Care Unit (NICU) and will provide more complex consultant-led care than a level two provision (such as, for instance, provided by the Southport and Ormskirk Hospital). The table demonstrates that in most cases the percentage of women giving birth in a consultant ward was much higher than that recorded for England (33.6%), ranging between 94.1% for the Liverpool Women's NHS Foundation Trust to 71.2% for the Mid Cheshire Hospitals NHS Foundation Trust. Only Southport and Ormskirk Hospital NHS Trust recorded a percentage that was significantly lower with 42.6%. With one exception, all Trusts also recorded percentages of births that took place in Midwife/ Other Wards that were significantly lower than the national average of 10.6%.[92] However, in the Warrington and Halton Hospital NHS Foundation Trust 16.8% of women gave birth in a Midwife/ Other Ward.

Table 21: Birth by setting and NHS Trust (%) (2020-2021)

NHS Trust	Consultant Ward Count(%)		GP Ward Count(%)		Consultant/ Midwife/ GP Ward Count(%)		Midwife/ Other Ward Count	(%)	Unknown Count(%)		Total Count(%)	
Countess of Chester Hospital MHS Foundation Trust	2,030	(87.7)	-	-	-	-	25	(1.1)	260	(11.2)	2,315	(100)
Liverpool Women's NHS Foundation Trust	6,805	(94.1)	-	-	-	-	385	(5.3)	45	(0.6)	7,235	(100)
Mid Cheshire Hospitals NHS Foundation Trust	2,235	(71.2)	580	(18.5)	-	-	160	(5.1)	165	(5.3)	3,140	(100)
Southport and	870	(42.6)	-	-	1,065	(52.2)	*	-	100	(4.9)	2,040	(100)

[92] We could not find a further breakdown of the category 'Other wards' in the HES glossary.

Ormskirk Hospital NHS Trust												
St. Helens and Knowsley Hospitals NHS Foundation Trust	3,265	(89.0)	-	-	310	(8.4)	55	(1.5)	40	(1.1)	3,670	(100)
Warrington and Halton Hospital NHS Foundation Trust	1,955	(80.3)	-	-	-	-	410	(16.8)	70	(2.9)	2,435	(100)
Wirral University Teaching Hospital NHS Foundation Trust	2,490	(87.8)	-	-	10	(0.4)	290	(10.2)	45	(1.6)	2,835	(100)
England	***187,846***	***(33.6)***	***1,053***	***0.2***	***179,585***	***(32.1)***	***59,148***	***(10.6)***	***132,096***	***(23.6)***	***559,728***	***(100)***

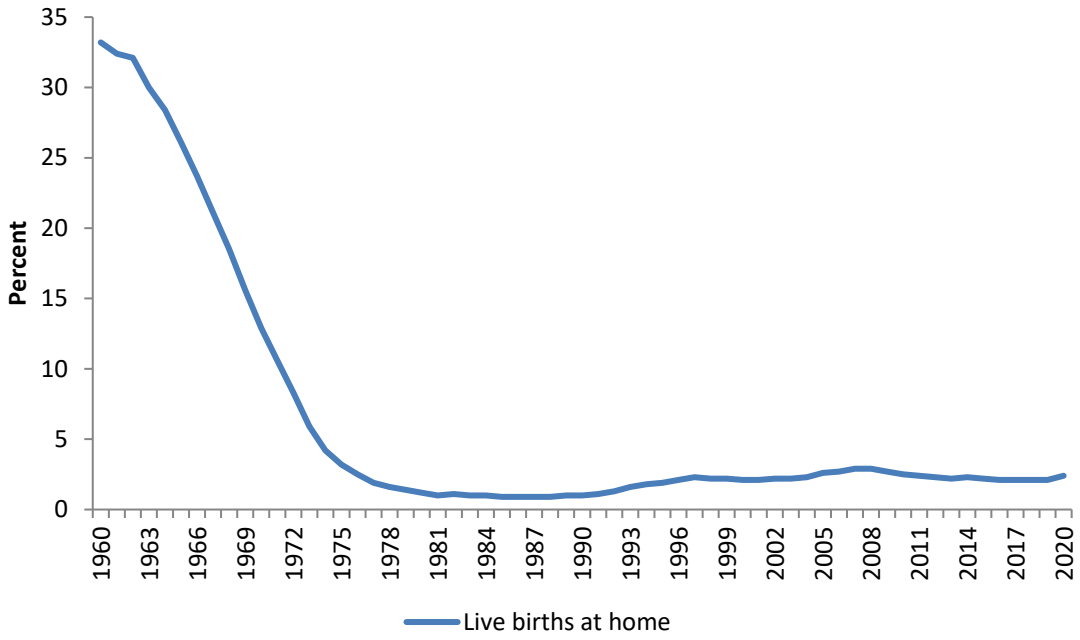
Source: NHS Maternity Statistics - England, 2020-2021: Hospital Episode Statistics 'Provider Level Analysis 2019-2020 to 2020-2021.[93] ** Data suppressed due to confidentiality as applies to less than 7 women.*

5.4.1. Home births

The percentage of home births in England and Wales has fallen dramatically over the decades, from 33.2 % in 1960 to an all-time-low of 0.9% in during the mid-1980s (see graph 14). After that time, the rate of home births rose again until 2007 and 2008 when it peaked at 2.9%, before it fell again slightly. From 2016 to 2019, the proportion of women giving birth at home remained constant at 2.1%. However, there has been a slight upward trend in 2020, as the rate rose to 2.4%.[94] The Office for National Statistics notes that this increase in home births could be linked to the Covid-19 pandemic which caused a disruption to health services and led to restrictions on birthing partners in 2020. The ONS states that this 'could have had an indirect effect on place of birth which may include people choosing to stay away from healthcare settings' (Office for National Statistics, 2022a).

[93]Find the dataset here: hosp-epis-stat-mat-hespla-2020-21.xlsx (live.com) [accessed: 12 September 2022].
[94]Please find ONS dataset 'Birth Characteristics; for 2020 here: https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/livebirths/datasets/birthcharacteristicsinenglandandwales [accessed: 13 September 2022].

Graph 14: Percentage of women giving birth at home, England and Wales 1960-2020



Source: Office for National Statistics, 'Birth characteristics in England and Wales: 2017' and Office for National Statistics, 'Birth characteristics in England and Wales: 2020'.[95]

Local data

Nationally, the percentage of women giving birth at home for 2020 was 2.3%. With respect to the nine local authorities, the percentage of births taking place at home varied from 1.2% in St. Helen's to 3.4% in Cheshire West and Chester (see table 22, below).

Table 22: Percentage of home births (2020)

Local Authority	Count	Percentage
Cheshire East	106	3.1
Cheshire West and Chester	109	3.4
Halton	18	1.5
Warrington	56	2.9
Knowsley	33	1.8
Liverpool	124	2.4
Sefton	66	2.8

[95]Data for the years 2010 onwards have been taken from ONS dataset, 'Birth characteristics in England and Wales: 2020'. Please find 'Birth characteristics in England and Wales: 2017' here: https://cy.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/livebirths/bulletins/birthcharacteristicsinenglandandwales/2017#:~:text=In%202017%20in%20England%20and%20Wales%2C%202.1%25%20of,women%20giving%20birth%20at%20home%2C%201960%20to%202017 [accessed: 15 September 2022] and Office for National Statistics, 'Birth characteristics in England and Wales: 2020' here: https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/livebirths/bulletins/birthcharacteristicsinenglandandwales/2020#place-of-birth[accessed: 15 September 2022].

St. Helens	22	1.2
Wirral	77	2.6
England & Wales	*14,281*	*2.4*
England	***13,268***	***2.3***

Source: Office for National Statistics (2020), 'Dataset Birth characteristics'.[96]

5.5. Person conducting birth

Table 23 below shows that nationally, midwives conducted 33.3% of births in 2020/2021 and hospital doctors conducted 29.5%. The caveat in this data set is that data regarding who conducted the birth was not always recorded; nationally it was 'not known' for a third of births (30.1%).[97] With regards to the known cases, midwives conducted 82.9% of spontaneous births and hospital doctors conducted 6.4%. A further 10.7% births were conducted by 'GP Other'.[98] NHS Digital notes that a direct comparison of data on the person conducting births before and after 2006-2007 is not possible due to changes in methodology. However, the data nevertheless indicate that there has been a steady decline in the percentage of births conducted by midwives in NHS Hospitals since the 1990s.[99] The percentages recorded for the year 1989-1990 were 23.7% for hospital doctors, 75.6% for midwives and 0.8% for GPs. Graph15 below highlights the change in the percentages of births conducted by different professionals since 2005-2006. The percentage for midwife-led births slowly decreased from 62.2% in 2005-2006 to 47.6% in 2020-2021, the percentage for hospital doctors increased from 34.5% to 42.2%, and the births conducted by GP/Other increased from 3.4% to 10.1%. This is also linked to the steady increase in births by Caesarean section (which increased from 23.5% of all births in 2005-2006 to 33.5% in 2020-2021 and 36% in 2021-2022).[100]

[96]See Office for National Statistics 'Dataset Birth characteristics' (2020) at https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/livebirths/datasets/birthcharacteristicsinenglandandwales [accessed: 13 September 2022].

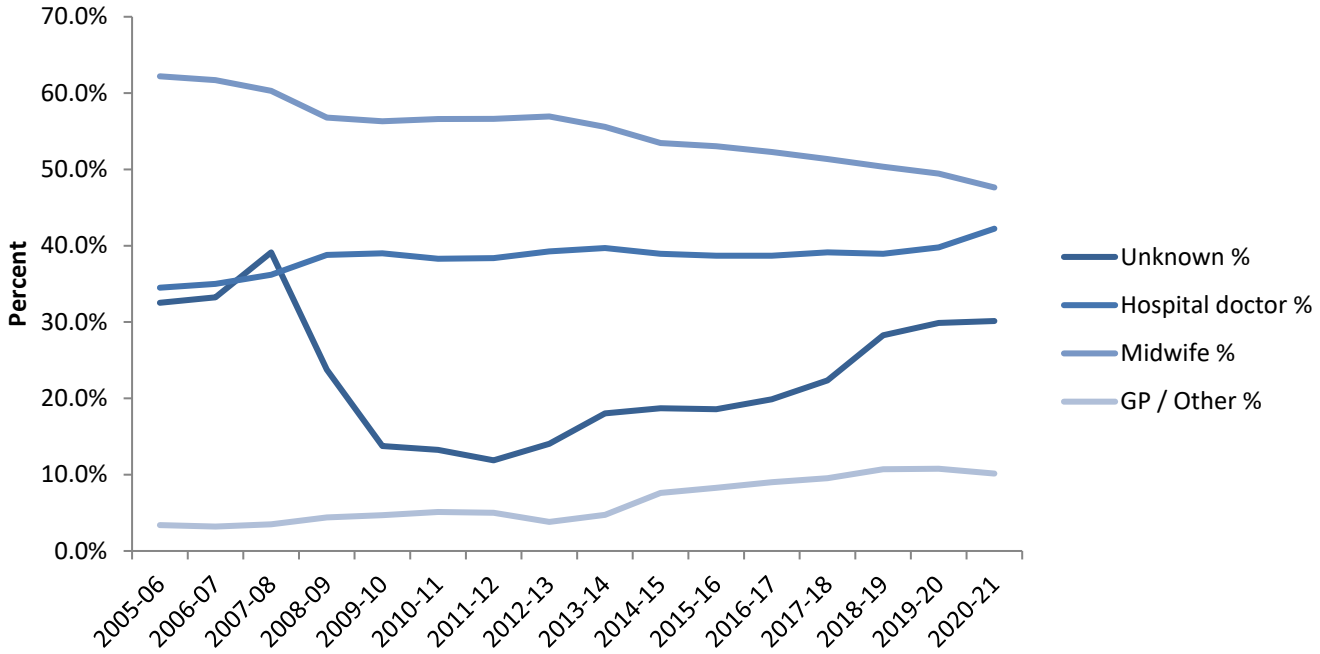
[97]Find the dataset 'Person Conducting Delivery; 2020-21' here: hosp-epis-stat-mat-hespla-2020-21.xlsx (live.com) [accessed: 12 September 2022].

[98]Find dataset 'Method of delivery by person conducting delivery, 2020-21' here: https://digital.nhs.uk/data-and-information/publications/statistical/nhs-maternity-statistics/2020-21 [accessed: 27 September 2022].

[99]Find dataset 'Time Series: Person conducting Delivery' here: https://digital.nhs.uk/data-and-information/publications/statistical/nhs-maternity-statistics/2020-21 [accessed: 27 September 2022].

[100]See the Hospital Episode Statistics in the NHS Maternity Statistics for various year: NHS Maternity Statistics, England - 2021-22 - NHS Digital [accessed: 7 December 2022].

Graph 15: Person conducting birth, NHS Hospitals England (2020-2021)



Source: NHS Maternity Statistics, England - 2020-21. 'Summary Report Tables'.[101]

Local data

Comparable detailed data were not available for all nine Trusts which are the focus of this JSNA. No detailed data were available for St. Helens and Knowsley Hospitals NHS Foundation Trust. With regards to the Southport and Ormskirk Hospital NHS Trust data was 'not known' for around a third of the births.

The Trust in which the highest proportion of births were carried out by hospital doctors (49.5%) was Countess of Chester NHS Foundation Trust, an increase from 43.6% recorded for 2013-2014 (Lewis et al., 2016, p.27). Nearly the same percentage of births in the Trust were carried out by midwives (49.2%), whilst the number of 'not known' cases was very low (1.3%). The Trust with the highest proportion of births (49.2%) carried out by midwives was Countess of Chester Hospital MHS Foundation Trust. Nevertheless, this presents a slight drop in percentages recorded for 2013-2014 (63.3%) (Lewis et al., 2016, p.27). Four further Trusts had percentages significantly higher for midwife-led births than the national average: Mid Cheshire Hospitals NHS Foundation Trust (46.5%), Wirral University Teaching Hospital NHS Foundation Trust (46.3%), Warrington and Halton Hospital NHS Foundation Trust (46.0%) and Liverpool Women's NHS Foundation Trust (45.3%). Over a third of births recorded for the Liverpool Women's NHS Foundation Trust (36.7%) and Warrington and Halton Hospital NHS Foundation Trust (35.7%) were recorded to have been carried out by 'other' including GPs.

[101] Find dataset 'Time Series: Person conducting Delivery' here: https://digital.nhs.uk/data-and-information/publications/statistical/nhs-maternity-statistics/2020-21 [accessed: 27 September 2022].

Table 23: Professional conducting each birth by Trust (%), 2020-2021

NHS Trust	Hospital doctor		Midwife		Other (inc. GP)		Not known		Total
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count
Countess of Chester Hospital MHS Foundation Trust	1,145	(49.5)	1,140	(49.2)	-	-	30	(1.3)	2,315
Liverpool Women's NHS Foundation Trust	1,260	(17.4)	3,275	(45.3)	2,655	(36.7)	45	(0.6)	7,235
Mid Cheshire Hospitals NHS Foundation Trust	1,075	(34.2)	1,460	(46.5)	435	(13.9)	165	(5.3)	3,140
Southport and Ormskirk Hospital NHS Trust	630	(30.9)	720	(35.3)	-	-	690	(33.8)	2,040
St. Helens and Knowsley Hospitals NHS Foundation Trust	-	-	-	-	-	-	3,670	(100)	3,670
Warrington and Halton Hospital NHS Foundation Trust	360	(14.8)	1,120	(46.0)	870	(35.7)	85	(3.5)	2,435
Wirral University Teaching Hospital NHS Foundation Trust	1,180	(41.6)	1,310	(46.2)	265	(9.3)	85	(3.0)	2,835
England	165,141	(29.5)	186,266	(33.3)	39,648	(7.1)	168,673	(30.1)	559,728

Source: NHS Maternity Statistics - England, 2020-2021: Hospital Episode Statistics 'Provider Level Analysis 2019-2020 to 2020-2021.[102] ** Data suppressed due to confidentiality as applies to less than 7 women.*

5.6. Method of birth by Trust

Local data

Table 24 shows births across the nine local authorities by NHS Trust and method of birth for 2020-2021 (where method of birth is known). Over half of all births at each hospital were spontaneous vaginal births, in line with the national average (53.8%). In most Trusts, around a third of births were by caesarean section (including both elective and emergency caesarean), with Countess of Chester Hospital MHS Foundation Trust seeing the highest proportion of births by caesarean (38.1%). As graph 16 shows, the percentage of births by Caesarean section has increased across all the Hospitals where comparative data was available since 2013-2014 (the data included in the MSNA 2016). The data also show that the countess of Chester Hospital had the highest increase in the percentage of Caesarean sections (an increase of 13%). Instrumental births (including breech extraction, forceps and ventouse) accounted for between 9.8% (St. Helens and Knowsley Hospitals NHS Foundation Trust) and 15.0% (Liverpool Women's NHS Foundation) of births.

[102] Find the dataset here: hosp-epis-stat-mat-hespla-2020-21.xlsx (live.com) (accessed: 12 September 2022].

Table 24: Method of birth by trust (%) (2020-2021)

NHS Trust	Caesarean**		Instrumental***		Spontaneous****		Other	Un-known	Total
	Count	(%)	Count	(%)	Count	(%)	Count	Count	Count
Countess of Chester Hospital MHS Foundation Trust	860	(38.1)	250	(11.1)	1,150	(50.9)	*	55	2,315
Liverpool Women's NHS Foundation Trust	2,400	(33.3)	1,080	(15.0)	3,730	(51.8)	-	30	7,235
Mid Cheshire Hospitals NHS Foundation Trust	830	(28.4)	365	(12.5)	1,725	(59.1)	-	225	3,140
Southport and Ormskirk Hospital NHS Trust	650	(32.2)	220	(10.9)	1,155	(57.2)	-	15	2,040
St. Helens and Knowsley Hospitals NHS Foundation Trust	1,320	(36.4)	355	(9.8)	1,950	(53.8)	*	45	3,670
Warrington and Halton Hospital NHS Foundation Trust	775	(32.0)	270	(11.2)	1,380	(57.0)	-	15	2,435
Wirral University Teaching Hospital NHS Foundation Trust	925	(32.9)	350	(12.5)	1,535	(54.6)	-	25	2,835
England	***184,004***	***(33.5)***	***69,445***	***(12.7)***	***294,977***	***(53.8)***	***41***	***11,261***	***559,728***

*Source: NHS Maternity Statistics - England, 2020-2021: Hospital Episode Statistics 'Provider Level Analysis 2019-2020 to 2020-202 – Table D: Method of Delivery; 2020-21, NHS Hospitals England'.[103] * Data suppressed due to confidentiality as applies to less than 7 women. **This includes 'Emergency caesarean' and 'Elective caesarean'. ***This category includes 'Breech extraction', Forcepts low', Forceps- other' and 'Ventouse'.****This category includes 'Breech-Other', 'Spontaneous vertex' and 'Spontaneous – other'.*

[103]Find the dataset 'Method of delivery; 2020-21, NHS Hospitals England' here: hosp-epis-stat-mat-hespla-2020-21.xlsx (live.com) [accessed: 12 September 2022].

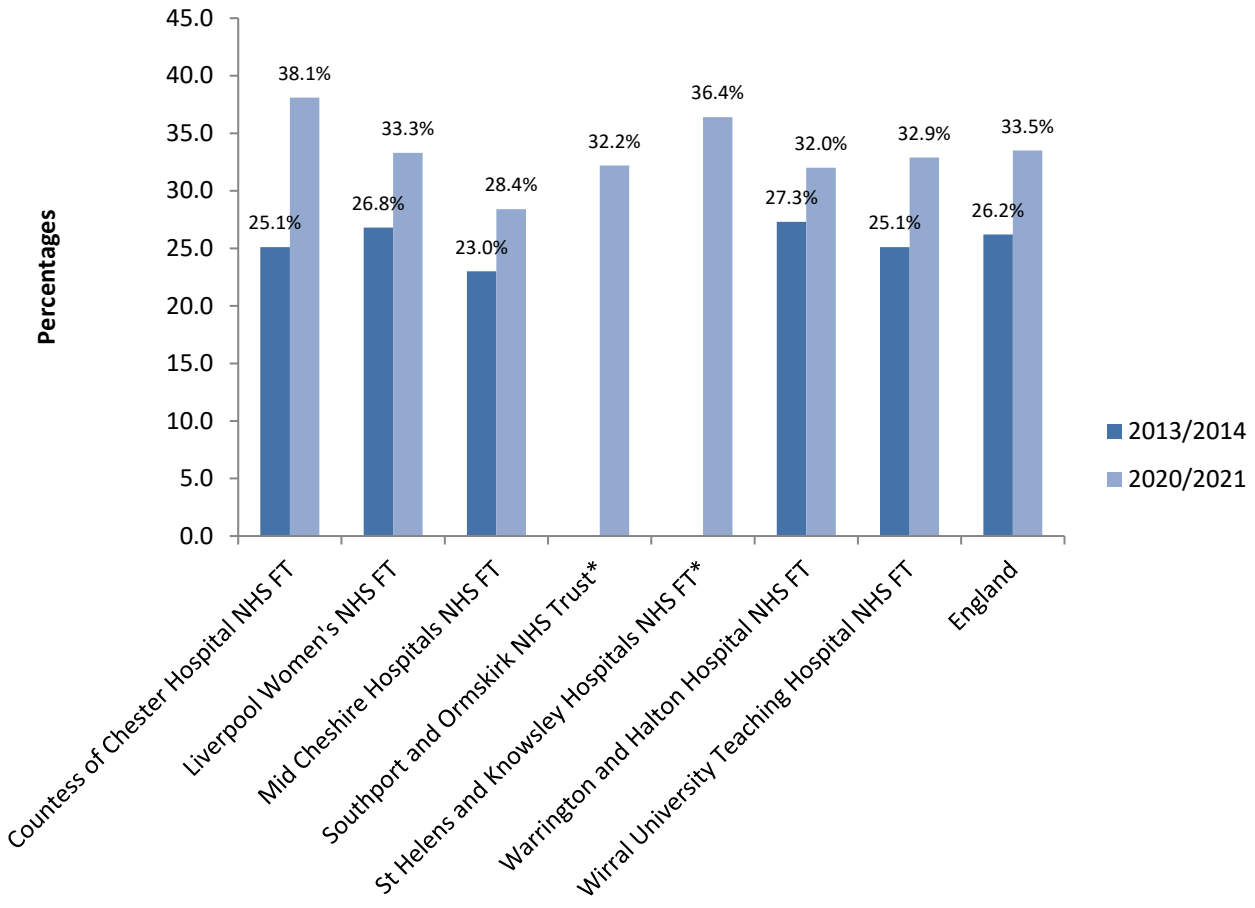
Table 25: Percentage of births in local authorities by caesarean section (2020/2021)

Local Authority	Count	Percentage of births by caesarean section
Cheshire East	970	28.6
Cheshire West and Chester	975	32.8
Halton	410	34.8
Warrington	580	33.2
Cheshire	2,935	-
Knowsley	565	33.6
Liverpool	1,565	31.9
Sefton	750	33.0
St. Helens	595	34.3
Wirral	835	31.7
Merseyside	4,310	-
England	***173,559***	***32.5***

Sources: Office for Health Improvement & Disparities, Fingertips/ Public Health Data, 'Child and Maternal Health: Caesarean section % (2020/2021)' . Based on Hospital Episode Statistics (HES), NHS Digital. [104]

[104] https://fingertips.phe.org.uk/profile/child-health-profiles/data#page/1/gid/1938133222 [accessed: 4 July 2022].

Graph 16: Comparison percentages of Caesarean sections by Trust (2013/2014 – 2020/2021)



*Sources: NHS Maternity Statistics - England, 2020-2021: Hospital Episode Statistics 'Provider Level Analysis 2019-2020 to 2020-202 – Table D: Method of Delivery; 2020-21, NHS Hospitals England' and MSNA 2016 (Lewis et al., 2016:28), based on Health and Social Care Information Centre statistics 2014. *Comparative data for 2013-2014 are not available.*

5.7. Costs and length of stay by type of birth

Few new data have become available with regards to the cost of NHS maternity care. In the MSNA 2016, Lewis et al. (2016, p.29) refer to the figures provided by the National Audit Office (2013)in their report 'Maternity services in England'. These figures are still the most up-to-date available. According to the National Audit Office (2013) report, the total cost of NHS maternity services in England was £2.6 billion in 2012-2013and the equivalent of £3,700 per birth. This represented around 2.8% of healthcare spending, a proportion that had not changed since the previous decade.

With regards to the cost of births in different birth settings, the most recent figures available are still those provided by the Birthplace in England Collaborative Group

(Schroeder et al., 2011).[105] The average costs per 'low risk' women for each birth location were as follows (rounded to the pound):

- £1,066 for a planned birth at home
- £1,435 for a birth in a free-standing midwife unit (FMU)
- £1,461 for a birth in a midwife unit alongside hospital services (AMU)
- £1,631 for a birth in a hospital maternity unit (obstetric unit - OU) (Schroeder et al., 2011, pp.15-16).

In sum, costs per birth were found to be lowest for planned births at home and highest in obstetric units. Planned births in OUs tended to be most expensive due to the greater burden of overheads and 'a longer duration of labour per episode, as well as higher rates of epidural use, general anaesthesia, augmentation of labour and instrumental delivery' (Schroeder et al., 2011, p.83), which increased the mean total cost per woman.

With regards to outcomes for the mother, 'planned place of birth in all non-OU settings generated incremental cost savings and improved maternal outcomes' (Schroeder et al., 2011, p.83). Planned births at home were the most cost-effective option (Schroeder et al., 2011, p.83; Schroeder et al., 2012, p.5). However, with regards to the baby, outcomes differed according to whether women had their first baby (nulliparous women) or their second or subsequent baby (multiparous women) at home. Whilst the study found that for multiparous women outcomes around the time of birth for the baby were similar to those in obstetric units, for nulliparous women giving birth at home carried a higher risk of adverse outcomes (Schroeder et al., 2011, p.83; Schroeder et al., 2012, p.5).

5.8. Full term or premature births per trust and local authority

Local data

Table 26 shows the gestation length at birth for women giving birth in Cheshire and Merseyside hospitals for the year 2020-2021. The majority of women at all Trusts gave birth between 30 and 40 weeks gestation. Births under 37 weeks gestation are considered preterm with those between 28 and <32 weeks considered very preterm and those <28 weeks considered extremely preterm. Between 4.8-13.8% of births at each NHS Trust were preterm. Liverpool Women's NHS Foundation Trust saw the highest proportion of babies that were extremely preterm (90; 1.2%), which correlates with it being a level 3 neonatal provider.

[105]The study collected data on low risk births from maternity services in NHS Trusts across England, to consider the cost and cost-effectiveness of births across all settings. Costs included any associated with the birth itself (e.g. midwifery care during labour and the cost of any stays after the birth by either mother or baby) and costs for planned home andmidwifery unit births take into account interventions and treatment that a woman may receive if she is transferred into hospital during labour or after the birth (see Schroeder et al., 2011).

Table 26: Gestation length at birth by trust (%) (2020-2021)

NHS Trust	22 or under Count (%)	23-25 Count (%)	26-28 Count (%)	29-31 Count (%)	32-34 Count (%)	35-37 Count (%)	38-40 Count (%)	41-43 Count (%)	44 or over Count (%)	Unknown Count (%)	Total Count (%)
Countess of Chester Hospital MHS Foundation Trust	-	*	*	10 (0.4)	45 (1.9)	320 (13.8)	1,555 (67.2)	345 (14.9)	-	35 (1.5)	2,315
Liverpool Women's NHS Foundation Trust	10 (0.1)	35 (0.5)	45 (0.6)	60 (0.8)	150 (2.1)	980 (13.5)	5,055 (69.9)	845 (11.7)	*	50 (0.7)	7,235
Mid Cheshire Hospitals NHS Foundation Trust	*	*	10 (0.3)	15 (0.5)	50 (1.6)	350 (11.1)	2,060 (65.6)	485 (15.4)	-	165 (5.3)	3,140
Southport and Ormskirk Hospital NHS Trust	-	*	*	15 (0.7)	35 (1.7)	220 (10.8)	1,360 (66.7)	305 (15.4)	-	100 (5.3)	2,040
St. Helens and Knowsley Hospitals NHS Foundation Trust	*	10 (0.3)	*	20 (0.5)	60 (1.6)	470 (12.8)	2,580 (70.3)	490 (13.4)	*	35 (1.0)	3,670
Warrington and Halton Hospital NHS Foundation Trust	10 (0.4)	*	*	20 (0.8)	30 (1.2)	285 (11.7)	1,635 (67.1)	385 (15.8)	-	70 (2.9)	2,435
Wirral University Teaching Hospital NHS Foundation Trust	*	15 (0.5)	15 (0.5)	20 (0.7)	55 (1.9)	340 (12.0)	1,865 (65.8)	480 (16.9)	-	45 (1.6)	2,835
England	***4,893 (0.9)***	***952 (0.2)***	***1,444 (0.3)***	***2,342 (0.4)***	***6,961 (1.2)***	***51,327 (9.2)***	***285,210 (51.0)***	***65,370 (11.7)***	***90 (0)***	***141,139 (25.2)***	***559,728***

Source: NHS Maternity Statistics - England, 2020-2021: Hospital Episode Statistics 'Provider Level Analysis 2019-2020 to 2020-2021 – Table B: Gestation length at delivery; 2020-21, NHS Hospitals England'.[106] ** Data suppressed due to confidentiality as applies to less than 7 women. All sub-national data has been rounded to the nearest 5.*

[106] Find the dataset 'Gestation length at delivery; 2020-21, NHS Hospitals England' here: hosp-epis-stat-mat-hespla-2020-21.xlsx (live.com) [accessed: 12 September 2022].

Table 27 below contains the number and rate of babies born preterm (under 37 weeks of gestation) per 1,000 births for England and the nine Local Authorities. The national rate for babies being born preterm in the time period (2018-2020) was 79.1. Liverpool was the Local Authority with the highest rate of preterm births (85.8 per 1,000), followed by Knowsley (82.6 per 1,000). Warrington had the lowest rate (71.3 per 1,000), followed by Wirral (74.5 per 1,000) and Cheshire East (25.2 per 1,000). The higher rate for Liverpool is concurrent with its status as level 3 maternity providers with NICUs, meaning that it cares for more complicated cases and pre-term babies.

Table 27: Premature births (less than 37 weeks gestation) (2018-2020)

Local Authority	Number	Births at less than 37 weeks gestation per 1,000
Cheshire East	811	75.2
Cheshire West and Chester	816	82
Halton	331	80.9
Warrington	445	71.3
Cheshire Total	*2,403*	-
Knowsley	478	82.6
Liverpool	1,430	85.8
Sefton	607	80
St. Helens	445	79.8
Wirral	699	74.5
Merseyside	*3,659*	-
England	***144,544***	***79.1***

Sources: Office for Health Improvement & Disparities, Fingertips/ Public Health Data, 'Child and Maternal Health: Premature births (less than 37 weeks gestation) (2018-2020)' . Based on ONS data. [107]

5.9. Low birth weight

Low birth weight (a weight of less than 2,500 grams) is an important indicator, as it is significant in predicting infant mortality. It increases the risk of childhood mortality and is linked to poorer long term health outcomes later in life (Marmot, Goldblatt and Allen, 2010; Lewis et al., 2016, p.31). In turn, social inequalities in England and Wales have been linked to low birth weight, which are then again likely to affect childhood and adult health inequalities in the future (Moser, Li and Power, 2003; Lewis et al., 2016, p.31). A clustering of a high proportion of low birth weight births in a population could indicate lifestyle issues of the mothers and/or issues with the maternity services (Lewis et al., 2016, p.31). As OHID (2022a)points out, therefore the indicator is in line with the Government's direction for public health on starting well through early intervention and prevention. It also features in the Department of Health's Business Plan

[107] https://fingertips.phe.org.uk/profile/child-health-profiles/data#page/1/gid/1938133222 [accessed: 4 July 2022].

'within the context of addressing issues of premature mortality, avoidable ill health, and inequalities in health, particularly in relation to child poverty'.[108]

Local data

The table below shows counts and percentages for 'Low weight of term babies' (live births with birth weight under 2500g and a gestational age of at least 37 complete weeks), 'Low weight of all babies' (live and still births with a recorded birth weight under 2500g) and 'Very low birth weight of all babies' (live and still births with a birth weight under 1500g). Percentages are with reference to all live births with recorded birth weight/ gestational age in 2020 in a given local authority.

In terms of the low birth weight for term babies (under 2500g and at least 37 weeks), the percentages all nine local authorities are below the percentage for England (2.9%). For the indicator 'Low birth weight of all babies', two out of the nine local authorities record percentages above the national figure (6.9%). Cheshire West and Chester has the highest percentage (7.5%), followed by Liverpool (7.3%). Knowsley (6.2%) had the lowest percentage. For the category 'Very low birth weight of all babies' (under 1500 g), the rates are similar to the England rate of 1.0%.

Table 28: Low birth weight per local authority (2020)

Local authority	Low birth weight for term babies (%)	Low birth weight of all babies (%)	Very low birth weight of all babies (%)
Cheshire East	62 (2)	219 (6.4)	34 (1.0)
Cheshire West and Chester	69 (2.3)	245 (7.5)	36 (1.1)
Halton	25 (2.2)	85 (6.7)	17 (1.3)
Warrington	42 (2.3)	125 (6.4)	26 (1.3)
Cheshire	198 -	674 -	113 -
Knowsley	37 (2.2)	112 (6.2)	16 (0.9)
Liverpool	112 (2.4)	379 (7.3)	60 (1.2)
Sefton	53 (2.4)	161 (6.7)	24 (1.0)
St. Helens	42 (2.5)	117 (6.4)	16 (0.9)
Wirral	65 (2.4)	194 (6.6)	26 (0.9)
Merseyside	*309* -	*963* -	*142* -

[108] https://fingertips.phe.org.uk/profile/child-health-profiles/data#page/6/gid/1938133222/pat/159/par/K02000001/ati/15/are/E92000001/iid/20101/age/235/sex/4/cat/-1/ctp/-1/yrr/1/cid/4/tbm/1 [accessed: 25/07/2022].

Cheshire & Merseyside LMS	-	*1,637 (6.8)*	*255 (1.1)*
England	***15,152 (2.9)***	***39,309 (6.9)***	***5,752 (1.0)***

Source: Based on Office for Health Improvement & Disparities, Fingertips/ Public Health Data, 'Child and Maternal Health: Low birth weight for term babies (2020), Low birth weight for all babies (2020), Very low birth weight of all babies (2020)'. Based on Office for National Statistics data.[109]

5.10. Stillbirths

The Office for National Statistics (ONS) 2020 dataset 'Births in England and Wales: 2020' provides data on stillbirths (babies born 'after 24 or more weeks completed gestation and which did not, at any time, breathe or show signs of life' (2021, p.7)). In general, stillbirths in England and Wales have been decreasing since records began in 1927, with a more pronounced decrease until the mid-1950s. Then followed a marked slow-down in decline, leading to a stagnation in the 1990s, until more recently (Office for National Statistics, 2021, p.5). The Office for Health Improvement & Disparities (OHID) highlights that nevertheless, the rate is one of the highest among high income countries. OHID summarises that risk factors linked to an increased stillbirth rate include: 'maternal obesity, ethnicity, smoking, pre-existing diabetes, and history of mental health problems, antepartum haemorrhage and fetal growth restriction (birth weight below the 10th customised weight percentile)'.[110] In 2015 the government announced an ambition to halve the rate of stillbirths by 2030.[111]

According to ONS data, in 2020 the number of stillbirths in England and Wales was 2,371, the lowest since records began in 1927 (and a 6% drop compared with 2019). In 2020, the stillbirth rate for England and Wales also decreased from the previous year (from 3.9 to 3.8 per 1,000), seeing the fourth year-on-year decrease in a row (2021, p.5). For the 2020, the stillbirth rate for England was 3.8 per thousand births, remaining at the same level as in 2019.[112]

Local data

The table below contains the counts and stillbirth rates for the nine Local Authority areas by area of residence. Five of the local authorities had stillbirth rates per 1,000 births that were higher than the rate for England (3.8), and four had rates that were lower. Warrington (4.6 per 1,000) was the local authority with the highest stillbirth rate per 1,000 births, followed by St. Helens (4.4 per 1,000), Cheshire East (4.3 per 1,000), and Halton (4.0 per 1,000) and Knowsley

[109] https://fingertips.phe.org.uk/profile/child-health-profiles/data#page/1/gid/1938133222 [accessed: 4 July 2022].

[110] Office of Office for Health Improvement &Disparities (2022), 'Indicator Definitions and Supporting Information: Indicator Stillbirth rate'. Online: https://fingertips.phe.org.uk/profile/child-health-profiles/data#page/6/gid/1938133222/pat/159/par/K02000001/ati/15/are/E92000001/iid/92530/age/29/sex/4/cat/-1/ctp/-1/yrr/3/cid/4/tbm/1 [accessed: 24/07/2022].

[111] See: https://www.gov.uk/government/news/new-ambition-to-halve-rate-of-stillbirths-and-infant-deaths [accessed 28/07/2022].

[112] Find data on stillbirths for various years in Office for National Statistics dataset 'Child mortality (death cohort) tables in England and Wales' Child mortality (death cohort) tables in England and Wales - Office for National Statistics (ons.gov.uk) [accessed: 13 October 2022].

(3.9 per 1,000). Cheshire West and Chester had the lowest rate (2.1 per 1,000), followed by Liverpool (2.7 per 1,000) and Wirral (3.0 per 1,000) and Sefton (3.3 per 1,000).

Table 29: Stillbirth counts and rate (2020)

Local authority	Number	Stillbirth rate per 1,000 births
Cheshire East	15	4.3
Cheshire West and Chester	7	2.1
Halton	5	4.0
Warrington	9	4.6
Cheshire		
Knowsley	7	3.9
Liverpool	14	2.7
Sefton	8	3.3
St. Helens	8	4.4
Wirral	9	3.0
Merseyside	*46*	*3.2*
England	***2,231***	***3.8***

Sources: Source: Office for National Statistics (2022), Information on the Child mortality (death cohort) tables, Dataset: 'Live births, stillbirths and infant deaths: area of residence, numbers and rates, 2020'. [113]

6. Postnatal period

6.1. Neonatal screening key performance indicators

Tables 30 and 31 show data for the antenatal screening key performance indicators (KPI) made available by NHS England for the fourth quarter of the reporting year 2021 to 2022.[114] Again, as with regards to the antenatal key performance indicator data provided for antenatal screenings in section 4.3, these data should be treated with caution as it covers the Covid-19 period (NHS England, 2022). The screening tests offered to babies after birth are the newborn/ infant physical examination, the newborn hearing screening and the newborn blood spot screening.

Local data

With regards to NP1 – the Newborn and Infant Physical Examination, the indicator measures how many infants are tested within 72 hours of birth for which conclusive results having been recorded. NHS England (2022) notes that the national performance in Q4 was 96.5% was slightly higher than the previous quarter (96.4%) and the national performance has remained above the acceptable threshold of 95% since 1 April 2018. With regards to the local screening services subject of this JSNA, table 30 shows that all but one service reported that NP1 met the

[113] See Child mortality (death cohort) tables in England and Wales - Office for National Statistics (ons.gov.uk) [accessed: 11 October 2022].

[114] Please find the dataset 'Antenatal and newborn screening KPI data: Q4 (1 January to 31 March 2022)' here: NHS screening programmes: KPI reports 2021 to 2022 - GOV.UK (www.gov.uk) [accessed: 5 October 2022].

acceptable threshold of 95%. The exception was Liverpool Women's NHS Foundation Trust (94.6%). East Cheshire NHS Trust was the only Trust to report meeting the target of 100%.

Table 30: Infant physical Examination (2021-2020, Q4, January to March 2022) (%)

Screening Service	NP1 Newborn and Infant Physical Examination Tested within 72 Hours and with conclusive result (Acceptable 95%; Target 100%)
Cheshire	
Countess of Chester Hospital NHS Foundation Trust	98.3
East Cheshire NHS Trust	100
Mid Cheshire Hospitals NHS Foundation Trust	96
Warrington and Halton Teaching Hospitals NHS Foundation Trust	96.5
Merseyside	
Liverpool Women's NHS Foundation Trust	94.6
Southport and Ormskirk Hospital NHS Trust	98.4
St. Helens and Knowsley Teaching Hospitals NHS Trust	97.9
Wirral University Teaching Hospital NHS Foundation Trust	96.4
North West	*95.8*
England	***96.5***

Source: NHS England (2022) 'Antenatal and newborn screening KPI data: Q4 (1 January to 31 March 2022)'.[115]

Newborn blood spot screening – NBS (also known as the heel prick test) is another routine screening process offered to an infant's parents, ideally when the newborn is five days old. Via the analysis of a blood sample, the screening covers 9 rare but serious conditions: sickle cell disease, cystic fibrosis, congenital hypothyroidism, and six inherited metabolic diseases (phenylketonuria, medium-chain acyl-CoA dehydrogenase deficiency, maple syrup urine disease, isovaleric acidaemia, glutaric aciduria type 1 (GA1) and homocystinuria (pyridoxine unresponsive) (Public Health England, 2016). As PHE (2016, p.5) notes, 'for the small number of babies affected, early detection, referral and treatment can help to improve their health and prevent severe disability or even death'. With regards to newborn bloodspot screening there are three KPIs: NB1 screening coverage, NB 2 avoidable repeat tests, NB3 the timeliness of results and NB4 the coverage of movers.

[115]Please find the dataset 'Antenatal and newborn screening KPI data: Q4 (1 January to 31 March 2022)' here: NHS screening programmes: KPI reports 2021 to 2022 - GOV.UK (www.gov.uk) [accessed: 5 October 2022].

Local and regional data

The KPI reports 2021 to 2022 provide data for three out of the four indicators (NM1, NB2 and NB4); Table 28 contains data for these indicators for the CCGs and Screening Services pertaining to the areas subject of this JSNA. With regards to NB1, the performance across England has remained above the acceptable threshold of 95% since 1 April 2018. Eight of the CCGs in Cheshire and Merseyside have met this acceptable threshold, with the exceptions of NHS Southport and Formby (93%).

In terms of NB2, the national performance in Q4 was 2.1% (lower than the previous quarter – 2.3%) but still above the acceptable threshold of 2% (NHS England, 2022). NHS England (2022) notes that there was a notably reduced 'avoidable repeat' rate during Q1 2020 to 2021 (1.4%) and explain that this was due to the COVID-19 pandemic during which time newborn screening laboratories were instructed to 'relax blood spot acceptance criteria on samples that would normally have been rejected and to accept day 4 samples' (NHS England, 2022). With regards to NB4, data was only available for the national and regional performance. Nationally, coverage was 81.6% in Q4 - according to NHS England (2022) the second lowest ever level recorded for this KPI after Q3. England's NB4 performance has remained below the acceptable threshold of 95% since 1 April 2018, and also the regional performance in the North West was below target (83.9%).

Table 31: Bloodspot screening coverage & avoidable repeat tests (2021-2020, Q4, January to March 2022) (%)

CCG	NB1 Newborn Bloodspot Screening Coverage by CCG (Acceptable 95%; Target 99%)
NHS Cheshire	96.7
NHS Halton	98.3
NHS Knowsley	96.2
NHS Liverpool	96.1
NHS Southport and Formby	93
NHS South Sefton	97.7
NHS St. Helens	97.8
NHS Warrington	97.7
NHS Wirral	97
North West	96.8
England	97

Screening Service	NB2 Newborn Bloodspot Screening voidable Repeat ests (Acceptable 2.0%)	NB4 Coverage in Movers (Target greater than or equal to 95%)
Countess of Chester Hospital NHS Foundation Trust	0.6	-
East Cheshire NHS Trust	0.9	-
Mid Cheshire Hospitals NHS Foundation Trust	1.9	-
Warrington and Halton Teaching Hospitals NHS Foundation Trust	3.1	-
Liverpool Women's NHS Foundation Trust	3.6	-
Southport and Ormskirk Hospital NHS Trust	2.6	-
St. Helens and Knowsley Teaching Hospitals NHS Trust	1.8	-
Wirral University Teaching Hospital NHS Foundation Trust	4.7	-
North West	2.1	83.9
England	2.1	81.6

*Source: Source: NHS England (2022) '*Antenatal and newborn screening KPI data: Q4 (1 January to 31 March 2022)*'.*

With regards to the newborn hearing screening, there are two KPIs: NH1 newborn hearing screening completed by four weeks, and NH2 Referral to Assessment within required timescale. The national performance of NH1 was 98.1%. NHS England (2022) remarks the acceptable threshold of 98% has nationally been met since Q3 2020 to 2021.

Local data

The data in table 32 show that two out of six screening services (Liverpool and St. Helens and Knowsley), and the total of the North West region, did not meet the threshold. NHS England (2022) explains that whilst NHSP encouraged services to continue screening where safe to do so during the COVID pandemic in 2020, in some areas screening was delayed, resulting in a lower coverage. NHS England (2022) adds that this particularly affected community services where health visitors suspended home visits. The national performance for NH2 in Q4 was 89.1% and thus also below the acceptable threshold (90%). However, it had recovered from the significant dips in Q4 2019 to 2020 (65.6%) and Q1 2020 to 2021 (64.7%), caused by the fact

that during the COVID-19 pandemic many audiology departments remained closed in line with national guidance. This resulted in a delay in the assessment of babies referred from the screen in most services.

Table 32: Newborn hearing screening (%) (2021-2020, Q4, January to March 2022)

Screening Service	NH1 Newborn Hearing Screening – Screen Complete by 4 Weeks (Hospital)/ 5 Weeks (Community) after birth (acceptable threshold 98%)	NH2 Newborn Hearing Screening - Referral to Assessment within required timescales (Achieved) - (acceptable threshold 90%)
Chester	99.4	-
Crewe	99.4	-
North Cheshire (Warrington)	98.4	-
Liverpool	94.6	-
St. Helens and Knowsley	96.9	-
Wirral	99.3	-
North West	*96*	*86.5*
England	***98.1***	***89.1***

Source: NHS England (2022) 'Antenatal and newborn screening KPI data: Q4 (1 January to 31 March 2022)'.

6.2. Breastfeeding initiation and prevalence at 6-8 weeks

Current national and international guidance recommends exclusive breastfeeding for around the first six months of life.[116] Multiple health benefits are associated with long-term breastfeeding for infant and mother, as well as with breast milk as first feed(s).[117]In brief, it provides the ideal nutrition for infants for the first months of their life (and also later delivers nutritional benefits), along with providing benefits to the immune system and antibodies which protect against childhood illnesses (Rollins et al., 2016; Victora et al., 2016; Ackerman et al., 2017; Wood et al., 2021). Breastfeeding lowers the risk of gastrointestinal and respiratory tract infections, and evidence suggests that it lowers the obesity risk later in life (Zivkovic et al., 2011; Horta, Loret de Mola and Victora, 2015). In terms of benefits to maternal health, there is evidence that breast feeding mothers have a lower risk of breast cancer and endometriosis, a greater postpartum weight loss and a lower body mass index (BMI) in the longer term.[118] There

[116] See WHO 'Breastfeeding recommendations'. Available online: https://www.who.int/health-topics/breastfeeding#tab=tab_2 [accessed: 25 July 2022].
See NICE Public Health Guideline (PH11) 'Maternal and child nutrition'. Available online: https://www.nice.org.uk/guidance/ph11 [accessed: 25 July 2022].

[117] See, for instance the various recent studies collated by the UNICEF Baby Friendly Initiative Research on supporting breastfeeding - Baby Friendly Initiative (unicef.org.uk) [accessed: 7 December 2022], including the article by Fox et al (2021) which highlights long-term cognitive benefits of breastfeeding for mothers.

[118]See NICE Public Health Guideline (PH11) 'Maternal and child nutrition: 2 Public health need and practice. Available online: 'https://www.nice.org.uk/guidance/ph11/chapter/2-public-health-need-and-practice [accessed: 25 July 2022].

is also evidence that breastfeeding protects against cardiovascular disease (Tschiderer et al., 2022) and ovarian cancer.[119]In sum, the expected benefits of breastfeeding for the health of infant and the mother lead to a reduction in illness and infection-related hospital admissions among young children (Quigley, Kelly and Sacker, 2007; Rollins et al., 2016; Victora et al., 2016). Increasing rates of breastfeeding initiation and continuation are recommended within the DH Healthy Child Programme.[120]

The last UK infant feeding survey which was conducted in 2010 (McAndrew et al., 2012), saw improved figures in breastfeeding initiation and exclusive feeding at six weeks compared to the previous survey (2005). Breastfeeding initiation had increased from 76% in 2005 to 81% in 2010. The percentage of babies that were totally or partially breastfed at age 6-8 weeks was 55% in 2010 (rising from 48% in 2005) and at six months it was 34% (rising from 25% in 2005). However, the rates for exclusive breastfeeding were much lower, with 17% at three months (up from 13% in 2005), 12% (up from 7% in 2005) at four months and around 1% at six months (as recommended by the WHO).[121]

The survey found variations in incidences of breastfeeding according to the age, ethnic background and professional occupation of mothers. Mothers who were 'aged 30 or over (87%), those from minority ethnic groups (97% for Chinese or other ethnic group, 96% for Black and 95% for Asian ethnic group), those who left education aged over 18 (91%), those in managerial and professional occupations (90%)and those living in the least deprived areas (89%)' (McAndrew et al., 2012, p.30) were most likely to breastfeed. As noted, there has been no new National Infant Feeding Survey in England since 2010; however interim data is collected quarterly for England, which is referred to below.

Local data

As noted, there has been a general upward trend with regards to breastfeeding and this is also mirrored in more recent figures. With regards to national figures for breastfeeding prevalence at 6-8 weeks, the rate increased from 43.20% in 2017/18 to a recent high of 48.10% in

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Also see Scientific Advisory Committee on Nutrition (SACN) report on feeding in the first year of life. Available online: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/725530/SACN_report_on_Feeding_in_the_First_Year_of_Life.pdf[accessed: 15 July 2022].

[119] See National Cancer Institute information on 'Ovarian, Fallopian Tube, and Primary Peritoneal Cancer Prevention (PDQ®)–Patient Version'. Available online at: https://www.cancer.gov/types/ovarian/patient/ovarian-prevention-pdq#:~:text=Breastfeeding%20is%20linked%20to%20a%20decreased%20risk%20of,the%20greatest%20decrease%20in%20risk%20of%20ovarian%20cancer [accessed: 24 July 2022].

[120]See Department of Health 'Healthy Child Programme: Pregnancy and the first five years of life'. Available online: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/167998/Health_Child_Programme.pdf[accesse: 24 July 2022].

[121]See The Baby Friendly Initiative (UNICEF UK) 'Breastfeeding in the UK', available online: https://www.unicef.org.uk/babyfriendly/about/breastfeeding-in-the-uk/#:~:text=Key%20findings%20were%3A%20Breastfeeding%20initiation%3A%2081%25%20%28up%20from,three%20months%3A%2017%25%20%28up%20from%2013%25%20in%202005%29 [accessed: 25 July 2022].

2019/2020, although it dropped slightly to 47.7% for 2020/2021.[122] Table 33 contains data for the variables 'Baby's first feed breast milk' for 2018/2019, and 'Breastfeeding prevalence at 6-8 weeks (partial or exclusive)'for 2020-2021 made available by the Office for Health Improvement & Disparities through their 'Fingertips – Public Health Data' Collection. Comparable percentages for breastfeeding prevalence at 6-8 weeks are not available for Halton, Knowsley, Liverpool and Wirral. Whilst the breastfeeding prevalence at 6-8 weeks for Cheshire East was above the national percentage with over half (51.1%) mothers still breastfeeding, the percentages of all other authorities were below the national average. St. Helen's (28.9%) had the lowest percentage of mothers continuing to breastfeed at 6-8 weeks. Percentages for infants who were given breast milk as their first feed were higher. However, all local authorities had a lower percentage than recorded for the national level (67.4%). Figures for Cheshire East (65.1%) and Cheshire West and Cheshire (63.1%) were closest to the national percentage. The local authority with the lowest percentage was Knowsley (43.6%) followed by St. Helens (47.9%) and Halton (49.3%).

Table 33: Baby's first feed breast milk (2018/2019) and breastfeeding at 6-8 weeks (2020-2021)

Local Authority	Baby's first feed breast milk (%)	Breastfeeding prevalence at 6-8 weeks (%)
Cheshire East	2,160 (65.1)	1,820 (51.1)
Cheshire West and Chester	1,930 (63.1)	1,372 (42.0)
Halton	555 (49.3)	301 (-)
Warrington	1,080 (58.7)	778 (41.3)
Cheshire	*5,725* *(-)*	*4,271* *(-)*
Knowsley	745 (43.6)	404 (-)
Liverpool	2,770 (58.7)	1,552 (-)
Sefton	1,275 (56.4)	818 (34.9)
St. Helens	805 (47.9)	523 (28.9)
Wirral	1,735 (58.7)	965 (-)
Merseyside	*7,330* *(-)*	*4,262* *(-)*
England	***371,730*** ***(67.4)***	***262,777*** ***(47.6)***

[122] https://fingertips.phe.org.uk/profile/child-health-profiles/data#page/4/gid/1938133222/pat/159/par/K02000001/ati/15/are/E92000001/iid/92517/age/170/sex/4/cat/-1/ctp/-1/yrr/1/cid/4/tbm/1 [accessed: 25 July 2022].

Sources: Office for Health Improvement & Disparities, Fingertips/ Public Health Data, 'Child and Maternal Health:Baby's first feed breast milk (2018/2019)'based on Maternity Services Dataset (MSDS) data, and 'Child and Maternal Health: Breastfeeding prevalence at 6-8 weeks after birth - current method (2020/21)'based on PHE's interim reporting of health visiting metrics.[123]

6.3. Infant mortality

The infant mortality rate records infant deaths under one year of age per 1000 live births. Apart from being a reflection on the health and care of mothers and newborns, infant mortality is seen as an important indicator of the general health of the population, which is in turn linked to wider determinants of population health, such as economic, social and environmental conditions (Brenner, 1973; Adamchak and Stockwell, 1978; Reidpath and Allotey, 2003; Marmot, Goldblatt and Allen, 2010).[124] Graph 17 below shows that the infant mortality rate has been on an overall downward trend in England and Wales over the past 100 years (Viner et al., 2018, p.8).It rose again, however, in 2015 (3.7), 2016 (3.8) and 2017 (3.9) before falling from 2018 (3.8) onwards to 3.6 in 2020.[125]

The neonatal mortality rate records the number of deaths under 28 days, per 1,000 live births.[126] It is important to consider this rate alongside the infant mortality rate (deaths 0-365 days), as the vast majority of deaths occur in the neonatal period. Out of 2,100 total infant deaths recorded in England for 2020, 1,564 were neonatal deaths (74.5%) and for England and Wales74.2% of deaths were of infants under 28 days old. The neonatal mortality rate has also seen an overall general decline in England and Wales, albeit with some fluctuation and less pronounced than that of the infant mortality rate. The rate decreased from 7.7 per 1,000 births in 1980 to 2.5 per 1,000 in 2014; then the downward trend ended as the rate rose again 2015 (2.6), 2016 (2,7) and 2017 (2.8), where it stabilised. In 2020, however, the rate fell again slightly to 2.7 per 1,000.[127] Viner et al. (2018, p.8) note in their RCPCH State of Child Health short report that as 'trends in mortality were similar across each of total infant (0-356 days), neonatal (0-28 days), and post-neonatal (29 – 365 days)infant mortality, as well as in perinatal mortality (children born after 24 weeks gestation without any sign of life plus deaths within the first 7 days of life) [...] [this] suggests a broad causal effect rather than one confined to pregnancy or the first days of life.'

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[123] https://fingertips.phe.org.uk/profile/child-health-profiles/data#page/1/gid/1938133222 [accessed: 8 July 2022].

[124]Studies have highlighted some of the problematic aspects of using the IMR for cross-country comparisons (due to variations in its definition across countries and health bodies), using mortality as a measure for the health of a population, and using the indicator to make comparisons over time and across counties (e.g. Masuy-Stroobant and Gourbin, 1995), but it nevertheless remains an important indicator, employed by Governments and (international) health organisations and UN bodies in monitoring the health and wellbeing of populations, as well as maternal and infant health.

[125]Find time series datasets on neonatal and infant mortality here: Child mortality (death cohort) tables in England and Wales - Office for National Statistics (ons.gov.uk) [accessed: 11 October 2022].

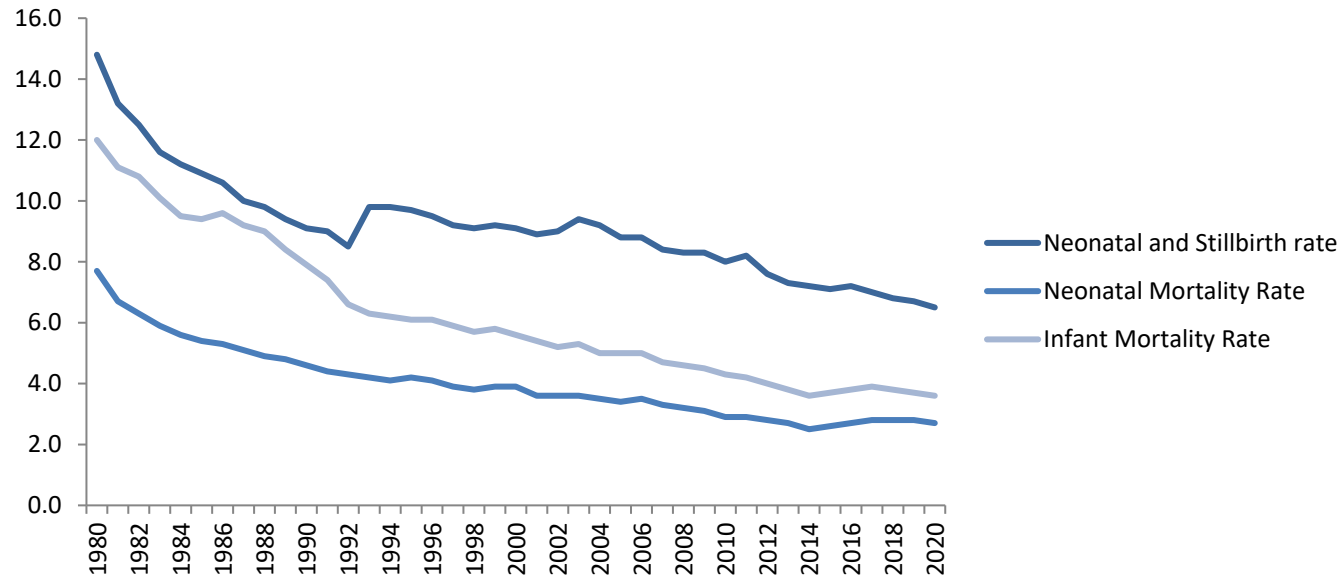
[126] For 'Neonatal mortality and stillbirths' definition, see https://fingertips.phe.org.uk/profile/child-health-profiles/data#page/6/gid/1938133222/pat/159/par/K02000001/ati/15/are/E92000001/iid/90510/age/23/sex/4/cat/-1/ctp/-1/yrr/1/cid/4/tbm/1/page-options/tre-do-1 [accessed: 25/07/2022].
For 'Infant mortality' see https://fingertips.phe.org.uk/profile/child-health-profiles/data#page/6/gid/1938133228/pat/159/par/K02000001/ati/15/are/E92000001/yrr/1/cid/4/tbm/1/page-options/tre-do-1 [accessed: 25 July 2022].

[127]See Child mortality (death cohort) tables in England and Wales - Office for National Statistics (ons.gov.uk) [accessed: 11 October 2022].

Reducing infant mortality overall, and the gap between the richest and poorest sectors, have over the years formed part of the government's strategy for public health (e.g. Healthy Lives, Healthy People: Our Strategy for Public Health England published November 2010).[128] In November 2015, the Health Secretary announced the aim to cut the rate of stillbirths, neonatal and maternal deaths in England by half by 2030, bringing the deadline forward to 2025 in an announcement in 2017.[129] The strategy involves the yearly review of cases by the Healthcare Safety Investigation Branch, tasked with standardising investigations of cases 'so that the NHS learns as quickly as possible from what went wrong and shares the learning to prevent future tragedies'.[130] In addition, the Saving Babies Lives Care Bundles were developed to help reduce the mortality rate.[131]

It remains to be seen, whether the target with regards to the prevention of neonatal deaths and stillbirths can be achieved, given the relatively slow recent downward trend, coupled with the currently deepening 'cost of living' crisis. This is worsening the broader economic, social and environmental conditions, which may negatively impact on the rates. In their projection of the development of Infant Mortality for 2030, Viner et al. (2018, p.9)note that even if the rate continues to decline yearly at their predicated rate (based on recent trends), infant mortality will be 80% higher than the median EU15+mortality (consisting of the 15 countries of the EU in 2004 plus Australia, Canada and Norway) by 2030.

Graph 17: Infant, neonatal and neonatal and stillbirth mortality rates, England and Wales (1980-2020)



[128] Find the corresponding policy paper here: Healthy Lives, Healthy People: Our strategy for public health in England (publishing.service.gov.uk) [accessed: 12 October 2022].

[129] See New ambition to halve rate of stillbirths and infant deaths - GOV.UK (www.gov.uk) and New maternity strategy to reduce the number of stillbirths - GOV.UK (www.gov.uk) [accessed: 12 October 2022].

[130] New maternity strategy to reduce the number of stillbirths - GOV.UK (www.gov.uk) [accessed: 12 October 2022].

[131] See NHS England » Saving Babies' Lives Care Bundle [accessed: 7 December 2022].

Source: Office for National Statistics (2022), Information on the Child mortality (death cohort) tables, Dataset: 'Live births, stillbirths, all infant deaths and child deaths under 16: numbers and rates, 1980 to 2020'. [132]

In terms of the causes of neonatal deaths, the Office for National Statistics (2022b) summarises that 'immaturity-related conditions continue to account for approximately 50% of neonatal deaths in 2020, with congenital anomalies and antepartum infections together accounting for another 38%'. For children over 28 days (and up to 15 years), the leading causes of death continue to be 'congenital malformations, deformations and chromosomal abnormalities ...followed by neoplasms' (Office for National Statistics, 2022b).With regards to deaths related to COVID-19, the ONS (2022) notes that this was recorded as 'the underlying cause of death of 11 children in 2020 and was mentioned on the death certificate of an additional two children', thus accounting for 1% of deaths of children in this age group.[133]

Commonly recognised factors associated with an increased risk of stillbirths, neonatal deaths and infant mortality rate include, 1) sociodemographic variables as poverty, ethnicity, maternal education and marital status, 2) birth characteristics such as preterm birth, low birth weight, maternal age and maternal smoking, alcohol consumption or obesity 3) factors linked to health service provision (Marmot, Goldblatt and Allen, 2010; Viner et al., 2018, p.10).[134] Many of these factors have been addressed in different sections of this JSNA. A range of post-natal factors also play a role; breastfeeding may reduce the neonatal and infant mortality rates(e.g. Sankar et al., 2015) due to the above-mentioned associated multiple health benefits of breastfeeding for the infant(see section 8.2) and safe sleeping positions are also key (e.g. The Child Safeguarding Practice Review Panel, 2020). The following provides a summary of some of the key findings for 2020with regards to some key risk factors[135]:

- *Poverty/ economic deprivation*: As noted, successive studies have highlighted a link between infant mortality, socio-economic status and socio-economic deprivation (Viner et al., 2018, p.8). Consistent with previous years, in 2020 infant mortality was highest in the population living in the most deprived areas in England. The 10% most deprived areas in England had an infant mortality rate of over double of that of the least deprived areas: 5.5 per 1,000 live births, compared with 2.4 per 1,000 in the 10% least deprived areas.[136]

[132] See Child mortality (death cohort) tables in England and Wales - Office for National Statistics (ons.gov.uk) [accessed: 11 October 2022].

[133] The Office for National Statistics (2022b) points out that 'these figures differ to other mortality statistics on deaths due to and involving COVID-19, which are based on the number of deaths registered in a reference period, rather than when they occurred'.

[134]Poverty appears as a key factor; as this 'lies at the root of many other risk factors for infant mortality' (Viner et al., 2018, p.10), not least because of the link between maternal health and socio-economic status. For other associated risk factors see for instance Infant mortality – RCPCH – State of Child Health [accessed: 7 December 2022]

[135] All data taken from datasets in the Child mortality (death cohort) tables in England and Wales - Office for National Statistics (ons.gov.uk) [accessed: 11 October 2022].

[136]The Office for National Statistic (2022b) notes that: 'deprivation deciles have been calculated separately for Lower Super Output Areas (LSOAs) in England and for Lower Super Output Areas (LSOAs) in Wales as their IMDs are not comparable'. Trends in Wales are more difficult to assess because of fewer infant deaths and resultant fluctuation (Office for National Statistics, 2022b). The IMD (Indices of Multiple Deprivation) is s a measure of relative deprivation for small areas (Lower Super Output Areas (LSOAs). It is a combined measure of deprivation

- *Parental education*: In 2020, babies with a parent from higher managerial, administrative and professional backgrounds had a rate of 2.6 deaths per 1,000 live births. Babies with a parent from routine and manual backgrounds had a rate of 4.8 deaths per 1,000 live births.

- *Ethnicity*: Infant mortality rates differ according to a baby's ethnicity. In 2020, babies recorded with an ethnic group recorded as 'Black' continued to have the highest rate (5.3 per 1,000) – nearly double that of babies recorded to be of a 'white' background (2.8 per 1,000) in England and Wales. This is followed by babies recorded to be of 'Asian' ethnicity (4.1 per 1,000), 'Any other ethnic group' (3.7 per 1,000), and babies for whom the ethnicity was recorded as 'mixed or multiple' (3.2 per 1,000). The ONS points out that 'small numbers of births and deaths in some ethnic groups can cause rates to fluctuate over time. Future data will confirm whether decreases seen in 2020 for these groups will be sustained' (Office for National Statistics, 2022b).

- *Marital status*: The infant mortality in England and Wales also varies according to marital status recorded for the parents. The two variables are 'inside marriage/Civil partnership and Joint registration same address' and 'Joint registration different address and Sole registration'. In 2020, the babies born to parents who fell under the first category had an infant mortality rate of 3.1 per 1,000 live births compared to babies whose parents fell under the second category (4.2 per 1,000 live births).

- *Preterm birth*: Corresponding to the known risk associated with a shorter gestational age, in 2020 the highest infant mortality rates for England and Wales were recorded for babies born at the lowest gestational age. The mortality rate at 24 weeks is extremely high – at 323.8 per 1,000 live births, and significantly higher for less than 24 weeks (e.g. 914.3 at 22 weeks). The rate for births at 37 weeks was 2.5 per 1,000 live births, dropping to 1.3 per 1,000 live births at 38 weeks (table 17). In terms of the neonatal mortality rate, for births at '24 weeks or over' this was 1.3 per 1,000 live births, over double that of births at '37 weeks or over' (0.5 per 1,000 live births)(Office for National Statistics, 2022b). According to the National Office for Statistics (2022b), the decline in the overall neonatal mortality rate (2.8 in 2019 to 2.7in 2020) corresponded with a decrease in the proportion of births under 24 weeks gestation.

- *Low birth weight*: Again, in line with previous years, the infant mortality rate in England and Wales was substantially higher for infants with low birth weights. It was 175.4deaths per 1,000 live births among babies with a very low birth rate (under 1,500g), and 27.5 deaths per 1,000 live births for infants with a low birth weight (less than 2,500g), compared to 0.8 per 1,000 among babies with a normal birth weight (2,500g and over).

- *Maternal age*: The infant mortality rates in England and Wales were highest among babies of mothers over 40 years of age (4.8 per 1,000), second highest in the age group

based on a total of 37 separate indicators that have been grouped into seven domains, each of which reflects a different aspect of deprivation experienced by individuals living in an area. IMD deciles range from 1 to 10, 1 being the most deprived and 10 being the least deprived(Office for National Statistics, 2022b).

'under 20 years'(4.0 per 1,000) and lowest for mothers aged 30-34 years (3.0 per 1,000), closely followed by the women of 25-29 years (3.1 per 1,000).

Local data

Table 34 below shows the neonatal and infant mortality rates for 2020 for the nine local authority areas (by area of residence). In terms of the neonatal mortality rate, four of the local authorities had rates that were equal to, or lower than, the national rate (2.7 per 1,000). Cheshire West and Chester had the lowest rate (1.8), followed by Warrington (2.6), and St. Helens and Wirral (both 2.7). Liverpool had the highest rate with a rate (3.7 neonatal deaths per 1,000 births), followed by Knowsley (3.3) and Halton (3.2). With regards to the infant mortality rate, five of the local authorities had infant mortality rates which lie over the national average (3.6 per 1,000)' with Knowsley recording the highest rate at 5.5 per 1,000 live births, followed by Liverpool (5.2). All Cheshire local authorities had rates lower than the national average, with Cheshire West and Chester recording the lowest rate (2.8 per 1,000 live births).

Table 34: Neonatal mortality and stillbirth rate & Infant mortality rate (2020)

Local authority	Neonatal mortality (under 28 days)		Infant mortality (under 1 year)	
	Number	rate per 1,000 births	Number	rate per 1,000 live births
Cheshire East	10	2.9	11	3.2
Cheshire West and Chester	6	1.8	9	2.8
Halton	4	3.2	4	3.2
Warrington	5	2.6	6	3.1
Cheshire	*25*	-	*30*	-
Knowsley	6	3.3	10	5.5
Liverpool	19	3.7	27	5.2
Sefton	7	2.9	9	3.7
St. Helens	5	2.7	7	3.8
Wirral	8	2.7	12	4.1
Merseyside	*45*	*3.2*	*65*	*4.6*
England	***1,564***	***2.7***	***2,100***	***3.6***

Sources: Office for National Statistics (2022), Information on the Child mortality (death cohort) tables, Dataset: 'Live births, stillbirths and infant deaths: area of residence, numbers and rates, 2020'. [137]

6.4. Unexplained infant deaths

Unexplained infant deaths include both sudden infant death and unascertained deaths in infants under one year of age. In 2020, there were 150 unexplained infant deaths in England and Wales, a rate of 0.24 per 1,000 live births. These deaths accounted for 6.7% of all infant

[137] See Child mortality (death cohort) tables in England and Wales - Office for National Statistics (ons.gov.uk) [accessed: 11 October 2022].The Office for National Statistics notes that 'Neonatal deaths are based on the death cohort. This dataset represents all infant deaths that occurred in a reference year, where possible linked to their birth registration and birth notification'.

deaths that year(Office for National Statistics, 2022c). As graph 18 shows, since 2004, the rate of unexplained deaths per 1,000 live births has seen a general downward trend in England and Wales, albeit with some fluctuations. The rate's year-on-year steady fall was disrupted in 2013, when it increased from 0.32 to 0.36 per 1,000 live births; it has since fluctuated before dropping to the all-time-low of 0.24 in 2020.[138] The ONS (2022c) notes, however, that the data for 2020 should be treated with caution, as it is provisional. The Covid-19 pandemic is likely to have led to registration delays for infant deaths, meaning that some deaths may have not been included in the provisional 2020 data.[139] In contrast to general infant deaths, which are more likely to occur in the neonatal period (under 28 days), unexplained infant deaths are more likely to happen later in infancy (between 28 days and one year). In 2020, 84% of all unexplained infant deaths occurred during that time (Office for National Statistics, 2022c).

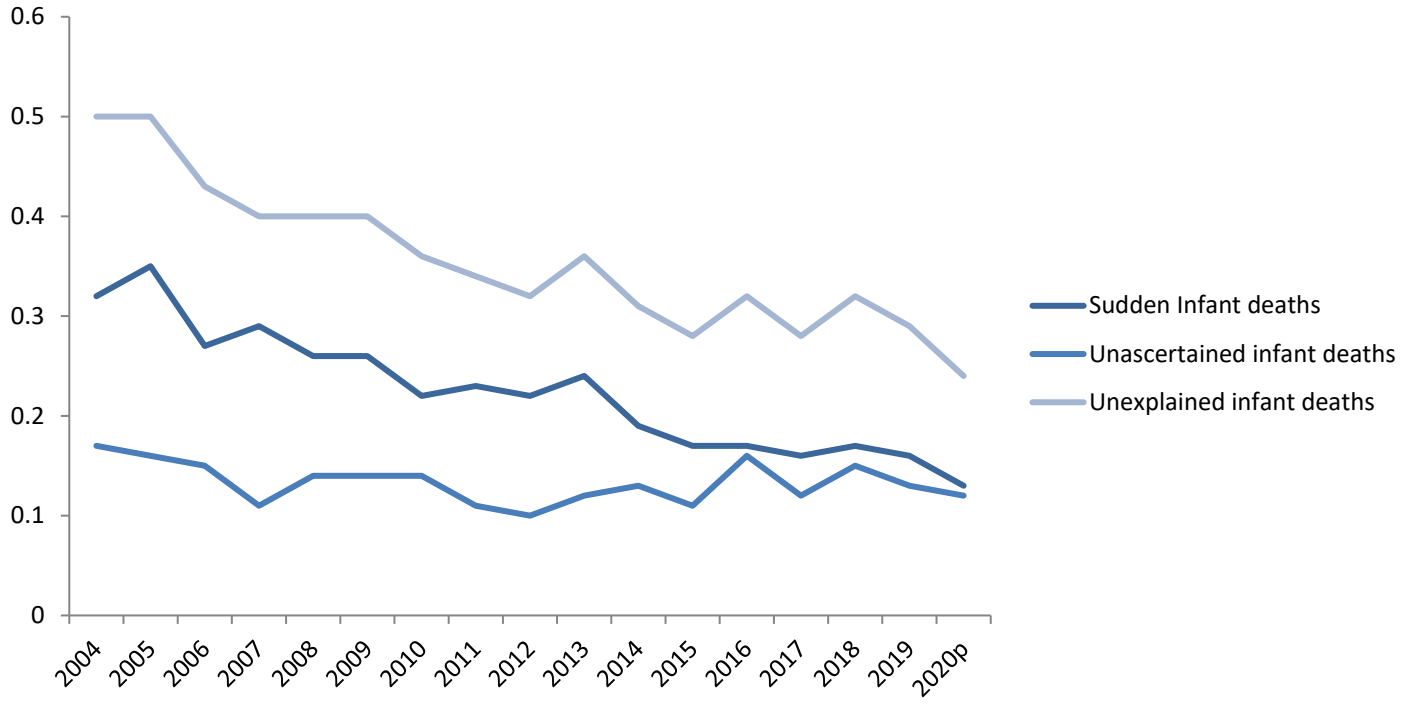
Sudden infant deaths have historically made up a large proportion of unexplained infant deaths. They accounted for 52% of unexplained deaths in England and Wales in 2020 (Office for National Statistics, 2022c). As graph 18 demonstrates, the sudden infant death mortality rate has seen a general decline between 2004 (0.32 per 1,000 live births) and 2020 (0.13 infant deaths), driving the overall decrease in unexplained infant deaths (Office for National Statistics, 2022c). According to the Office for National Statistics (2022c), reasons for this general decline are likely linked to 'a greater availability and awareness of guidance for parents from the NHS and charities such as The Lullaby Trust, who raise awareness of safer sleep practices for parents [and] a decrease in maternal smoking, as documented in official NHS statistics on women's smoking status at time of giving birth'.[140]

[138]Find the dataset 'Unexplained deaths in infancy, England and Wales' for 2020 here: https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/datasets/unexplaineddeathsininfancyenglandandwalesreferencetables [accessed: 18 October 2022].

[139]The office for National Statistics (2022c)states that this data will be published in 2023.

[140]Also seethe Child Safeguarding Practice Review Panel Report (2020).

Graph 18: All unexplained infant mortality rates, England and Wales(2004 to 2020p*)



Source: Office for National Statistics (2022) dataset 'Sudden infant deaths, unascertained deaths and all unexplained infant deaths by sex and age at death, England and Wales, 2004 to 2020'.[141]
** 'p' indicates provisional data.*

The main risk factors include: low birth weight, premature birth, maternal age, marital status, maternal smoking (which can affect foetal growth during pregnancy – also see section 7.1, below) and socio-economic classification. Other risk factors include gender (boys are slightly more at risk), sleeping position, sleep environments including unplanned bed-sharing and sleeping with a baby on a sofa, not breastfeeding, temperature and exposure to tobacco smoke (Ostfeld et al., 2010). The following provides data on some of the key risk factors:

- *National Statistics Socio-economic classification (NS-SEC)*: The unexplained infant mortality rate was significantly lower for cases where at least one parent was classified as 'managerial and professional' (0.08 per 1,000 live births), compared with where the NS-SEC was recorded as 'intermediate' 0.18 per 1,000). For infants where a parent's NS-SEC was recorded as 'routine and manual', the rate was over 4.5 times higher (0.37 per 1,000) than for infants where it was recorded as 'managerial and professional'.[142]

[141] Find the dataset here:https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/datasets/unexplaineddeathsininfancyenglandandwalesreferencetables [accessed: 10 October 2022].
[142] See Table 10 in dataset 'Main tables: Unexplained deaths in infancy, England and Wales' 2020 edition https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/datasets/unexplaineddeathsininfancyenglandandwalesreferencetables [accessed: 10 October 2022].The Office for National Statistics points out that from 2012, the data is based on the highest of the parent(s) occupation at birth registration. Moreover, a joint registration records details of both parents, and requires them both to be present. NS-SEC was

- *Mother's country of birth*: The unexplained infant mortality rate for babies of mothers born in the UK is consistently more than double the rate for babies of mothers born outside of the UK. In 2020 it was 0.30 per 1,000 for mothers born in the UK and 0.12 per 1,000 for mothers born outside the UK.[143]This is interesting as the neonatal mortality rate and infant mortality rate for 2020 were higher for women born outside the UK. The neonatal mortality rate was 2.3 per 1,000 for babies born to women born in the UK (2.6 per 1,000 for women born elsewhere) and the infant mortality rate was 3.2 per 1,000 for babies born to women born in the UK (3.5 per 1,000 for women born elsewhere).[144] No data are yet available to explain this difference.[145]

- *Marital status and type of registration*: Like the infant mortality in England and Wales, the rate of all unexplained infant deaths also varies according to the marital status recorded for the parents, and the type of registration. The provisional rate recorded for the variable parents 'Inside marriage/Civil partnership' in 2020 was 0.11 per 1,000 live births, down from 0.15 recorded for 2019, and half the rate recorded for 2004 (0.22). In contrast, the rate for the category parents 'outside marriage/civil partnership' was 0.38 per 1,000 in 2020, down from 0.45 in 2019 (0.87 in 2014).With regards to types of registration, the rates were lowest for infant registered via a 'Joint registration/ Same address' (0.26 per 1,000 live births), over double that for 'Joint registration/ Different address (0.56 per 1,000 live births) and highest for registrations by a single parent registration ('Sole registration') (0.78 per 1,000 live births).[146]

- *Maternal age*: The unexplained death rate is higher in younger mothers. In 2020 the rate of unexplained infant deaths was over seven times higher for mothers aged under 20 years (1.07 per 1,000 live births) than mothers aged 30 to 34 years, who had the lowest rates (0.15 deaths per 1,000 live births). Mothers aged 20-24 years had a rate of 0.51 per 1,000, followed by mothers aged 25-10, who had the second highest rate of

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developed the replace 'social class' and is the UKs official socio-economic classification. See The National Statistics Socio-economic classification (NS-SEC) - Office for National Statistics (ons.gov.uk) [accessed: 20 October 2022].

[143]See Table 7 in dataset 'Main tables: Unexplained deaths in infancy, England and Wales' 2020 edition https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/datasets/unexplaineddeathsininfancyenglandandwalesreferencetables [accessed: 10 October 2022].

[144] See table 11 in 2020 dataset 'Child mortality (death cohort) tables in England and Wales' available here: https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/datasets/childmortalitystatisticschildhoodinfantandperinatalchildhoodinfantandperinatalmortalityinenglandandwales [accessed: 8 November 2022].

[145]The Office for National Statistics (2022c) offers a part-explanation in the face of missing further data. They note: 'although we do not have the data available to explain this difference, it may be partly because of the different age profiles of unexplained infant deaths compared with all infant deaths. For example, unexplained infant deaths are most likely to occur during the postneonatal period, where the postneonatal mortality rates are similar for both mothers born inside and outside the UK [both 0.9 per 1,000 for 2020]. Infant deaths from other causes, however, tend to occur during the neonatal period, where the mortality rate is higher for mothers born outside the UK'.

[146]See Table 9 in dataset 'Main tables: Unexplained deaths in infancy, England and Wales' 2020 edition https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/datasets/unexplaineddeathsininfancyenglandandwalesreferencetables [accessed: 10 October 2022].

0.22 per 1,000. Mothers over 40 had the second lowest rate (0.17 per 1,000) followed by mothers ages 35-39 (0.18 per 1,000).[147]

- *Gender of the infant*: Male infants have consistently had a higher risk of unexplained infant death than females, though the gap has decreased over time. In 2004, males had 0.58 unexplained deaths per 1,000 live births, compared with 0.41 for females. In 2020, males had 0.30 unexplained deaths per 1,000 live births, compared with 0.19 for females (Office for National Statistics, 2022c).

- *Birth weight:* The rate of unexplained infant deaths is consistently highest among babies with very low and low birth weights. In 2020 the rate for babies with very low birth weights (under 1,500g) was 1.20 per 1,000 live births.[148] The rate for low birth weight babies (less than 2,500g), is consistently around four times higher than babies with a normal birth weight (over 2,500g). In 2020 the rate was 0.96 per 1,000 for low birth weight babies and 0.19 for babies of normal birth weight (Office for National Statistics, 2022c).

Regional data

In terms of regional variation, the provisional national unexplained infant death rate recorded for 2020 was 0.25per 1,000 live births, nearly half that of the rate recorded for 2004 (0.47 per 1,000) and down from 0.29 in 2019. The North West rate for 2020 was 0.29 per 1000 live births (the same rate recorded for 2019), slightly higher than the England rate. Of all the regions in England, Yorkshire and Humber had the highest rate (0.43 per 1,000 live births).[149]

6.5. Perinatal mental health: postnatal depression and other forms

Whilst many women experience mild mood changes during pregnancy and after birth, more severe perinatal mental health problems affect between 10% to 20% of women during pregnancy and the first year after having a baby (Bauer et al., 2014). Depression and anxiety are among the most common mental health problems; around 12% of women experience depression and 13% experience anxiety (or both) at some point(Public Health England, 2019b).Depression can occur alongside other anxieties such as post-traumatic stress disorder (PTSD) and tokophobia (an extreme fear of childbirth) during pregnancy and the postnatal period. Psychosis can emerge, re-emerge or be exacerbated (women with bipolar disorder being are at particular risk)(NICE, 2014). PHE (2019b) notes that whilst the risk of developing a severe mental health condition is low it increases after childbirth. The RCP(2021, p.42) provides the following rates for perinatal psychiatric disorders per 1,000 maternities:

[147]See Table 6 in dataset 'Main tables: Unexplained deaths in infancy, England and Wales' 2020 edition https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/datasets/unexplaineddeathsininfancyenglandandwalesreferencetables [accessed: 10 October 2022].
[148]See Table 5 in dataset 'Main tables: Unexplained deaths in infancy, England and Wales' 2020 edition https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/datasets/unexplaineddeathsininfancyenglandandwalesreferencetables [accessed: 10 October 2022].
[149]See Table 4 in dataset 'Main tables: Unexplained deaths in infancy, England and Wales' 2020 edition https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/datasets/unexplaineddeathsininfancyenglandandwalesreferencetables [accessed: 10 October 2022].

Table 35: Rates of perinatal psychiatric disorders per 1,000 maternities (UK)

Disorder	Rate per 1,000 births
Post-partum psychosis	2
Chronic serious mental illness	2
Severe depressive illness	30
Mild to moderate depressive illness and anxiety	100-150
Post-traumatic stress disorder	30
Adjustment disorders and distress	150-300

Source: The Royal College of Psychiatrists (2021, p.42), drawing on data from NICE (2014), Howard et al. (2014) and Jones et al. (2014).

Early detection and a good management of perinatal mental health problems are important to increase a woman's quality of life during pregnancy and after, and to reduce levels of morbidity and mortality among mothers and infants. If undetected or untreated, they can 'have lasting effects on maternal self-esteem, partner and family relationships, and the mental health, emotional and social development of the child'(Royal College of Psychiatrists, 2021, p.15).[150]A focus on perinatal mental health is also key to the prevention of suicides in pregnancy and after birth, a leading cause maternal of deaths in the past two decades (see MBRRACE (2022) report and section 6.6 'Maternal Deaths' below).

Whilst any woman may develop mental health problems during pregnancy and in the first year after giving birth, there are a number of known risk factors (most of which are also relevant to the mental health of the general population).[151] These include poverty, migration status, extreme stress, exposure to violence (domestic, sexual and gender-based), exposure to childhood abuse or neglect, interpersonal conflict, emergency and conflict situations, trauma, experiences of loss (e.g. death of an infant), inadequate social support and a family or personal history of mental health issues (Public Health England, 2019b). Added risk factors especially for postpartum depression are alcohol and drug abuse, and/ or unplanned or unwanted pregnancy (Public Health England, 2019b). Co-morbidities and the role of social determinants of health are often key to serious disorders.[152] The RCP (2021, pp.37-38) identifies a number of population

[150]Whilst it is beyond this JSNA to address the causalities which link maternal mental health to that of their infant(s) as these are complex and include genetic, biological and environmental factors, it is important to note that certain perinatal mental health conditions have been associated with 'long-term negative effects on the infant's cognitive, social and emotional development' (Royal College of Psychiatrists, 2021, p.15).

[151]PHE (2019a) recognises that the wider determinants of health in an area (social and contextual factors which may include employment, crime, safety and housing, the ability to earn enough money and feeling part of a community) affect mental health (also see: Faculty of Public Health and Mental Health Foundation, 2016). Find more information with regards to environmental factors affecting mental health here: 2. Mental health: environmental factors - GOV.UK (www.gov.uk) and population factors here: 3. Mental health: population factors - GOV.UK (www.gov.uk) [accessed: 10 November 2022]. PHE (2019a) recognises that the wider determinants of health in an area (social and contextual factors which may include employment, crime, safety and housing, the ability to earn enough money and feeling part of a community) affect mental health (also see: Faculty of Public Health and Mental Health Foundation, 2016).

[152]According to the Royal College of Psychiatrists (2021, p.16), suicides associated with serious perinatal mental health disorders are often linked to 'early life adversity, multiple social disadvantages and comorbid substance use' (2021, p.16).

groups which face particular challenges which may impact on an individual's perinatal mental health. These include:

- *Women from Black and minority ethnic backgrounds*: As noted in other sections of this JSNA, women who identify to be from to be 'Black' or from ethnic minority backgrounds are more likely to also have adverse outcomes in other areas related to pregnancy and birth. Moreover, according to Watson et al. (2019) women might find accessing perinatal mental health services challenging due to language barriers, a lack of accessible information, cultural factors, or multifaceted social or financial issues.

- *Asylum seekers and refugees*: Due to their experience of migration or displacement, and other possible life experiences which are risk factors in perinatal mental wellbeing (potential experiences of trauma, torture, loss or separation from family, including their own children, current deprivation, general adversity, as well as fear of deportation), this group is particularly vulnerable(Royal College of Psychiatrists, 2021, p.37).

- *Teenage mothers*: There is evidence that women aged 16-25 are much more likely than older women to suffer from perinatal mental health problems (Lockwood Estrin et al., 2019). [153]

- *LGBTQ+ parents*: Challenges of being an LGBTQ+ parent may include feeling a 'double stigma associated with mental health problems and being an LGBTQ parent' (Royal College of Psychiatrists, 2021, p.37), which may affect the individual and/or a possible partner/co-parent. People who identify as LGBTQ+ may face significant discrimination, lack of societal acceptance and general issues and complications around conception, fostering or adoption which may cause or compound perinatal mental health problems (e.g. Ross, Steele and Epstein, 2006).[154]

- *Sufferers of previous mental illness*: As noted above, a history of previous mental health disorders puts women at an increased risk during pregnancy. There is also a link between physical and mental health problems; women with a history of mental illness may struggle with physical health (and struggle to access support with this). Such problems may be directly linked to their treatment, resulting in glucose intolerance and raised BMI (Royal College of Psychiatrists, 2021, p.38), which in turn are linked to a risk of adverse pregnancy outcomes (also see section 6.5 below).

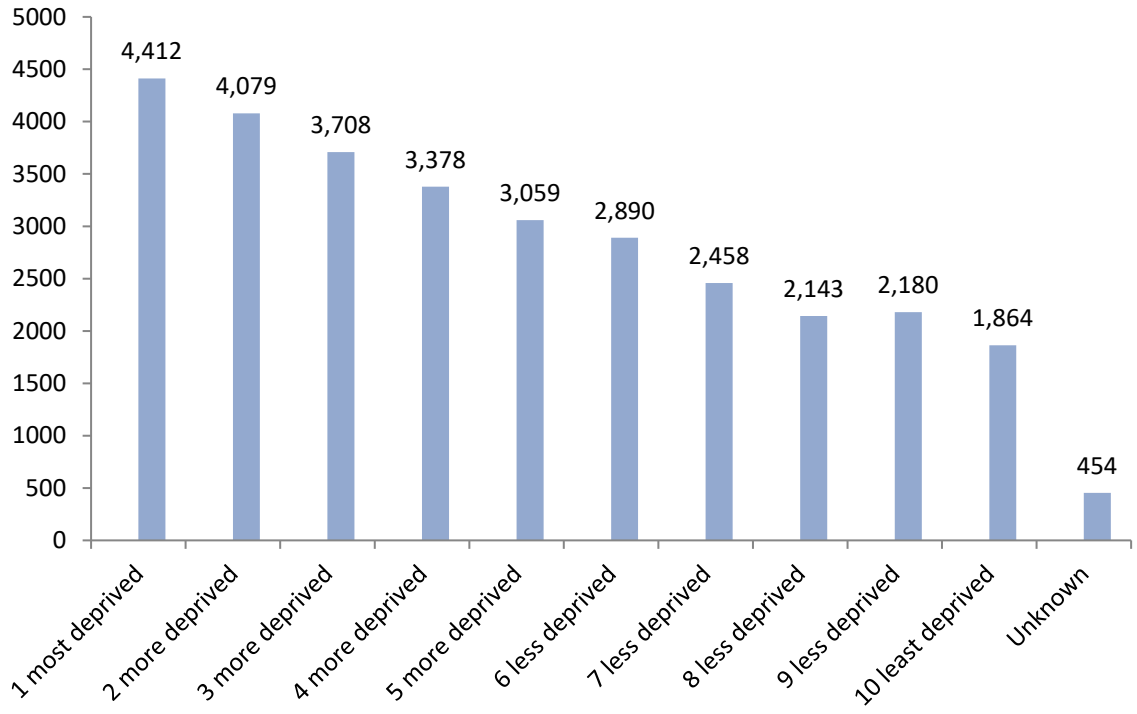
- *Levels of deprivation*: As already briefly mentioned, there is also a clear link between perinatal mental health issues and levels of deprivation. As graph 19 demonstrates, the number of women who contacted specialist perinatal mental health community services in the year 2019-2020 gradually increased according to the decile of multiple

[153] An added problem is that women in that age group may fall between child and adolescent mental health services (CAMHS) and adult services; especially where there is a need for psychiatric intervention, they require combined expertise of specialist perinatal mental health clinicians and CAMHS clinicians(Royal College of Psychiatrists, 2021, p.38).

[154] For transgender men who become pregnant there are some added specific implications for the psychological health and well-being, 'as a result of the internal and external conflicts and tensions between the social norms that define a pregnant person as woman and a gestational parent as mother' (Royal College of Psychiatrists, 2021, p.37).

deprivation a woman's residence, from 1,864 women in the least deprived areas to 4,412 in the most deprived areas.

Graph 19: Number of people in contact with specialist perinatal mental health community services by indices of multiple deprivation, England (2019-20)



Source: NHS Digital (2021), 'Mental Health Bulletin: 2019-20 Annual report: Reference tables'.[155]

Routine antenatal and postnatal appointments where pregnant women and new mothers have contact with health services (e.g. GPs, midwives, health visitors) provide opportunities for health professionals to discuss issues of perinatal mental health with women, identify potential problems and sign-post or refer to specialist services. However, despite these opportunities and the fact that response to mental health treatment is generally good, 'these problems frequently go unrecognised and untreated in pregnancy and the postnatal period' (NICE, 2014). This may partly be due to an unwillingness or inability of some women to access such services, or unawareness of their existence, or partly because perinatal health service provision might still not be sufficiently available. In 2015 a report estimated that 85% of localities did not have specialist perinatal mental health services to the level recommended in NICE guidelines (Public Health England, 2019b). The NHS Five Year Forward View implementation plan included the objective that there will be increased specialist mental health support (NHS England, 2016) in all areas by 2020 to 2021. The NHS Long Term Plan (2019) reiterated a commitment to 'improve access to and the quality of perinatal mental health care for mothers, their partners

[155]Find the 'Mental Health Bulletin: 2019-20 Annual report: Reference tables' here: https://digital.nhs.uk/data-and-information/publications/statistical/mental-health-bulletin/2019-20-annual-report [accessed: 11 November 2022].

and children' (2019, p.48).[156] As part of this the NHS aims to make care provided by specialist perinatal mental health services available from preconception to 24 months after birth (currently provided to 12 months after birth).[157] Lastly, in line with the recognition that the mental health of each individual is influenced by their social setting (social and contextual factors – the wider determinants of health) (Public Health England, 2019a), PHE (2019b) notes that local inequalities need to be identified in order to ensure equity in early access to, and the provision of mental health services. The success of such measures is yet to be measured.

Local data

The most current local data with regards to the prevalence of perinatal mental health conditions are available for the year 2017-2018 via the OHID Fingertips/ Public Health Data, 'Perinatal Mental Health Indicators (2017/2018)' (see table 36). The data show that the percentages for different kinds of perinatal mental health conditions (based on the estimated prevalence of the conditions) were in line with the national percentages across all CCGs which are subject of this JSNA.

[156] However, as it is recognised that there are regional variations across the UK with regards to the level of investment in perinatal mental health services, the wider context of health care provision, as well as varying local needs according to population and geography, and that therefore models of care adopted my vary (Royal College of Psychiatrists, 2021, p.41).

[157] This is in line with the cross-government ambition for women and children focusing on the first 1,001 critical days of a child's life. Find the policy paper here: The best start for life a vision for the 1 001 critical days.pdf (publishing.service.gov.uk) [accessed: 11 November 2022].

Table 36: Estimated prevalence of conditions in perinatal period per CCG (2017-2018)

CCG	Postpartum Psychosis **Count (%)**	Chronic SMI (Serious mental illness) **Count (%)**	Severe depressive illness **Count (%)**	Mild-moderate depressive illness and anxiety (lower estimate) **Count (%)**	Mild-moderate depressive illness and anxiety (upper estimate) **Count (%)**	PTSD **Count (%)**	Adjustment disorder and distress (lower estimate) **Count (%)**	Adjustment disorder and distress (higher estimate) **Count (%)**
NHS Eastern Cheshire	3 (0.3)	3 (0.3)	43 (3.9)	144 (13.1)	216 (19.6)	43 (3.9)	216 (19.6)	432 (39.3)
NHS South Cheshire	3 (0.3)	3 (0.3)	45 (3.9)	150 (13.1)	226 (19.7)	45 (3.9)	226 (19.7)	451 (39.3)
NHS Halton	2 (0.2)	2 (0.2)	33 (3.9)	110 (13.1)	165 (19.6)	33 (3.9)	165 (19.6)	331 (39.4)
NHS Knowsley	3 (0.3)	3 (0.3)	46 (3.9)	154 (13.1)	231 (19.6)	46 (3.9)	231 (19.6)	462 (39.3)
NHS Liverpool	9 (0.3)	9 (0.3)	135 (3.9)	449 (13.1)	673 (19.6)	135 (3.9)	673 (19.6)	1346 (39.3)
NHS Southport and Formby	2 (0.3)	2 (0.3)	24 (4.0)	79 (13.1)	118 (19.6)	24 (4.0)	118 (19.6)	236 (39.1)
NHS South Sefton	3 (0.3)	3 (0.3)	39 (3.9)	131 (13.1)	196 (19.6)	39 (3.9)	197 (19.7)	394 (39.3)
NHS St. Helens	3 (0.3)	3 (0.3)	46 (3.9)	153 (13.1)	229 (19.6)	46 (3.9)	229 (19.6)	458 (39.2)
NHS Warrington	3 (0.2)	3 (0.2)	49 (4.1)	163 (13.5)	224 (18.6)	49 (4.1)	224 (18.6)	488 (40.6)
NHS Wirral	5 (0.3)	5 (0.3)	77 (3.9)	256 (13.1)	385 (19.7)	77 (3.9)	385 (19.7)	765 (39.1)
England	***984 (0.3)***	***984 (0.3)***	***14,766 (3.9)***	***49,219 (13.1)***	***73,828 (19.6)***	***14,766 (3.9)***	***73,828 (19.6)***	***147,656 (39.3)***

Source: Office for Health Improvement & Disparities, Fingertips/ Public Health Data, 'Perinatal Mental Health Indicators (2017/2018)'. Based on data from the Office of National Statistics 'Births, deaths and marriages' and Hospital Episode Statistics. [158]

[158] Find the datasets here: Perinatal Mental Health - OHID (phe.org.uk) [accessed: 11 November 2022].

6.6. Maternal deaths

A maternal death is internationally defined as a death of a woman during childbirth, pregnancy or up to six weeks (42 days) after the end of pregnancy, from any cause related to, or aggravated by, pregnancy or its management (excluding accidental or incidental causes), irrespective of the duration of the pregnancy.[159] As the WHO points out, the high number of maternal deaths in certain regions reflect global socio-economic inequalities and inequalities in access to quality health services. Accordingly94% of all maternal deaths in 2017 occurred in low and lower middle-income countries; the MMR in low income countries in 2017 was 462 per 100,000 live births versus 11 per 100,000 live births in high income countries.[160] In the UK the number of maternal deaths is comparatively low, but many challenges in reducing maternal deaths and the maternal death rate remain. The latest MBRRACE-UK report (Knight et al., 2022) provides the most recent data on maternal deaths for the UK and Ireland (2018-2020).

According to the report, in the three year period of 2018-2020247 women died during or within 42 days of the end of pregnancy in the UK. Whilst the deaths of 18 women were classified as coincidental, 229 women died from direct causes (e.g. obstetric haemorrhage, hypertensive disorders in pregnancy, complications of anaesthesia or caesarean section) and indirect causes (e.g. an existing cardiac, renal or any other disease aggravated by pregnancy).[161] This equates to a maternal death rate of 10.90 per 100,000 maternities. This presents a renewed increase compared with 2017-2019(8.79 per 100,000 maternities), after a drop in the rate compared with 2016-2018 (9.71 per 100,000 maternities), and 2003-2005 (13.95 per 100,000 maternities). However, the report's authors noted that since 2003-2005 the maternal death rate has seen an overall decrease. Deaths due to indirect causes made up the majority proportion of all direct and indirect deaths (52%). The rate of indirect maternal deaths decreased by 21% (from 7.19. to 5.71) and the direct maternal death rate decreased by 23% since 2003-05 (from 6.76 to 5.19) (Bunch and Knight, 2022, p.2). The direct maternal mortality rate has however risen significantly between 2015-17 and 2018-20 (3.82 to 5.19) and the authors note that 'it is concerning that maternal mortality rates,

[159] This definition contrasts with 'deaths occurring during pregnancy, childbirth and puerperium (also known as a 'pregnancy-related death')' which includes unintentional/accidental and incidental causes. See WHO fact sheet Maternal mortality (who.int) [accessed: 20 October 2022].

[160] The WHO notes that worldwide approximately 810 women died from preventable causes related to pregnancy and childbirth every day in 2017, condemning the numbers as 'unacceptably high'. However, the Organisation notes that some advances have been made; between 2000 and 2017, the MMR dropped by about 38% worldwide. See WHO fact sheet Maternal mortality (who.int) [accessed: 20 October 2022].

[161] MBRRACE follows the WHO in categorising 'direct maternal (or obstetric) deaths' as those 'resulting from obstetric complications of the pregnant state (pregnancy, labour and puerperium), and from interventions, omissions, incorrect treatment, or from a chain of events resulting from any of the above'. 'Indirect maternal (or obstetric) deaths' are those 'resulting from previous existing disease or disease that developed during pregnancy and not due to direct obstetric causes but were aggravated by the physiologic effects of pregnancy'. 'Coincidental deaths' are those from unrelated causes, which happen to occur during pregnancy or the puerperium. 'Late maternal death' is 'the death of a woman from direct or indirect obstetric causes, more than 42 days but less than one year after termination of pregnancy'. Like maternal deaths, late maternal deaths also include both direct and indirect maternal/obstetric deaths. See: Maternal deaths (who.int) [accessed: 12 November 2022].

overall, direct and indirect have increased, albeit the increase is only statistically significant for direct deaths' (Bunch and Knight, 2022, p.3).

Between March and December 2020, 9 deaths of women who were either pregnant or within six weeks of the end of pregnancy were directly attributable to Covid-19 (a maternal mortality rate of 1.60 per 100,000 maternities in that time period) (Bunch and Knight, 2022, p.9). The MBRRACE authors conclude that 'there is little doubt that changes to and pressures on maternity services as a result of the Covid-19 pandemic also contributed to some of the other maternal deaths during this same period' (Bunch and Knight, 2022, p.9). The report highlights that the mortality rate due to pregnancy-related sepsis has been steadily rising since 2012-2014 to a point where it has become statistically significant. Hence, a 2021 rapid report (Knight et al., 2021)highlighted the importance of 'thinking sepsis, and not just COVID-19' (Bunch and Knight, 2021, p.11).

A further 289 women died between six weeks and one year after the end of pregnancy in the period 2018-2020, and are thus counted as 'late maternal deaths' (a mortality rate of 13.7 per 100,000 maternities).[162]The leading causes of death during this period are listed under the categories 'drug & alcohol/ others' (20%), 'Coincidental – malignancy' (18%), 'Suicide' (18%), followed by 'Cardiac disease' (9%) (Bunch and Knight, 2022, p.10). The rate of maternal suicides has remained unchanged from 2007-2919(Bunch and Knight, 2021, pp.11-12; Bunch and Knight, 2022). Bunch and Knight (2022, p.10)point out that combined with deaths from psychiatric causes, such deaths account for 38% of maternal deaths during this period. Whilst the majority of deaths by suicide occur between six weeks and a year after pregnancy,[163]there has been a statistically significant increase in the rate of suicide during pregnancy and up to six weeks after pregnancy in the UK since the last report (2017-2019) (from 0.46 per 100,000 to 1.48) (Bunch and Knight, 2021, p.9). The MBRRACE-UK (2022, p.33) report highlights that as these women often faced multiple disadvantages (often a diagnosis of depression or history domestic violence (also see Royal College of Psychiatrists, 2021, p.16)) and dealt with several separate agencies, cross-agency cooperation would have been key to prevention.[164]

Successive MBRRACE reports have highlighted that the maternal mortality varies by age, socioeconomic status and ethnic background and is higher among women who face multiple disadvantages and /or medical co morbidities (Nair et al., 2015; Nair, Knight and Kurinczuk, 2016):

- *Levels of deprivation:* As graph 20 shows, the most deprived areas continue to have the highest maternal mortality rate (17.96 per 100,000) compared to the lowest rate

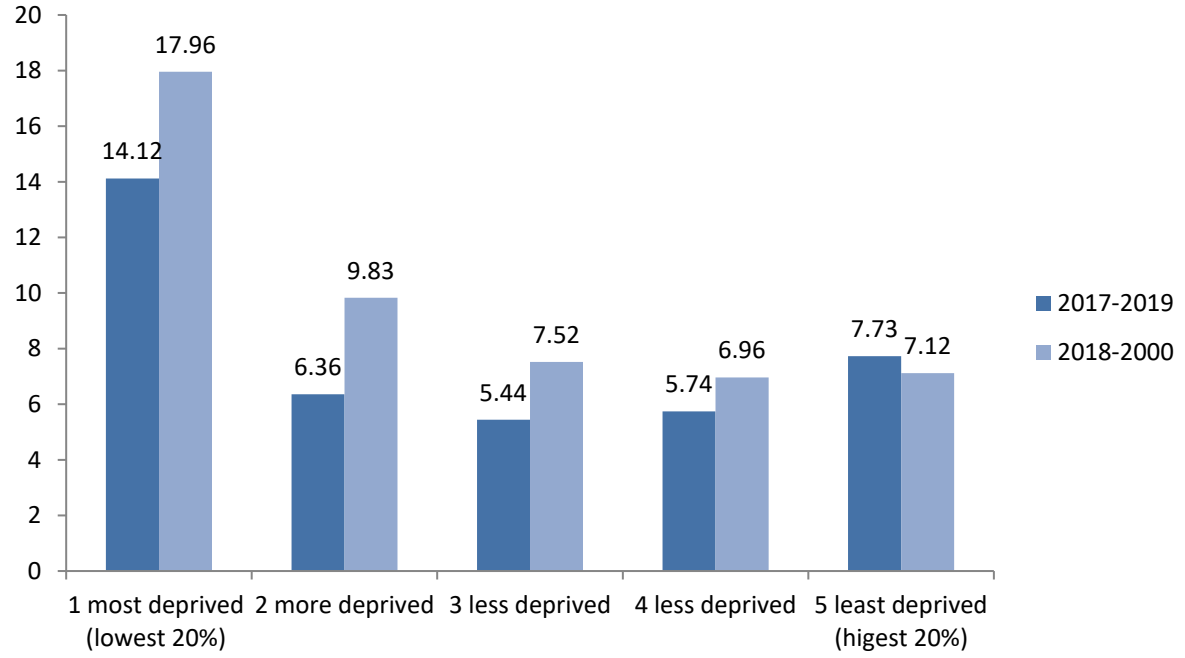
[162]Bunch and Knight (2022, p.10) noted that 'there has been no change in the rate of late pregnancy-related deaths since the first MBRRACE-UK confidential enquiry report'.

[163] There is some evidence that suicide risk peaks towards the end of the first postnatal year (Royal College of Psychiatrists, 2021, p.16).

[164]The authors note that as multiple agencies were involved in the care of woman who died through suicide or substance misuse. MBRRACE found that improvements to care may have made a difference to the outcome in more than two thirds of women who died by suicide and more than a third of those who died from substance misuse 2018-2020 (Cairns et al., 2022, p.33).So there is a need for agencies to work closely together in reducing recognised risks and 'when planning contacts [in order] to maximise the likelihood of attendance and engagement' (Cairns et al., 2022, p.33).

among women living in the third least deprived area(6.96 per 100,000) (Bunch and Knight, 2022, p.13). The rates increased to since 2017-2019 from 14.12 per 100,000 for the most deprived quintile and5.44 per 100,000 for in the third least deprived area. However, whilst in recent years the rate among women living in the least deprived areas has been increasing, this was the sole rate to record a slight fall between 2017-2019 and 2018-2020 from 7.73 to 7.12 per 100,000 maternities (Bunch and Knight, 2021, p.13; Bunch and Knight, 2022, p.13).[165]

Graph 20: Maternal mortality rate by IMD Quintiles, England (2017-2019 and 2018-2000)



Source: MBRRACE-UK (2021, p.15)and MBRRACE (2022, p.13) reports

- *Ethnicity:* The maternal mortality rate amongst women from 'Black' ethnic backgrounds remains more than three-and-a-half times higher (33.99 per 100,000 maternities) in comparison to women from a 'White' backgrounds (9.23 per 100,000). There has been is a slight decrease in the difference in maternal mortality rates between the two groups since 2017-2019 when women from 'Black' ethnic backgrounds had a rate that was four times higher (31.61 per 100,000 maternities), compared to white women (7.04 per 100,000). There is still an almost two-fold risk for women from 'Asian' ethnic backgrounds (16.12 per 100,000, an increase from 11.74 per 100,000 in the previous period) and an increased risk among women who identify to be from a 'mixed background' (12.30 per 100,000, a drop from 15.41 per 100,000 in the previous period) compared to women who self-identified as 'White'.

[165]Bunch and Knight (2021, p.13) note that the increase in the mortality rate amongst women living in the least deprived quintile in 2017-2019 was predominantly due to deaths from cardiovascular disease (8 women, 40% of deaths).

Notably, of the 9 women who died from Covid-19, 5 were Asian and 3 were Black (Bunch and Knight, 2021, p.15; Bunch and Knight, 2022, p.13).[166]

- *Age:* Like in the previous period the highest mortality rate was among women over 40 (25.30 per 100,000 maternities), followed by women under 20 (15.35 per 100,000) and women aged 35-39 (13.24 per 100,000). The lowest rate was among women aged 20-24 (8.45 per 100,000) (Bunch and Knight, 2022, p.13).

- *Multiple disadvantages*: Women with severe and multiple disadvantages appear to be over-represented among women that die (the main elements being previous or current mental health diagnosis, substance use and domestic abuse). According to the MBRRACE data available, of the 535 women who died in the UK in 2018-2020 during or up to one year after pregnancy, 61 (11%) can be considered to be at severe and multiple disadvantage(Bunch and Knight, 2022, p.15), a significant increase from 8% (40 women) recorded for2016-18 and 2017-2019 (Bunch and Knight, 2021, p.17).[167]

- *Medical co-morbidities*: 137 (60%) of the women who died in the triennium 2018-20 were known to have pre-existing medical problems (no further breakdown of the conditions is given) and a further 9 women (4%) had cardiac problems. 84 women (37%) were known to have pre-existing mental health problems. 62 women (27%) were classified as 'obese' (BMI ≥ 30kg/m2) and a further 55 women (24%) were overweight (BMI=25-29 kg/m2). Finally, 10 women (4%) who died during or up to six weeks after pregnancy had a pregnancy as a result of an assisted conception procedure, this compares to 13 women (6%) in 2015-17(Bunch and Knight, 2022, p.16).[168]

Local data

Please note that detailed local figures are not available for this section, as numbers of maternal deaths are low in each locality and criteria of anonymity can thus not be met by data providers. Pooled three-year data (2018-2020) are available via the 'Compendium of health indicators: Maternal Mortality (ICD –10 O00–O99)' via NHS Digital (2022) drawing on ONS statistics 'deaths registered in England and Wales' mid-year population estimates.[169] As the data have been rounded to the nearest '5', the count of maternal deaths in the period for all local authorities subject of this JSNA is '5'. 80 deaths are recorded for England; the count for the North West region is 10 –equal to the average recorded for all regions in England. London recorded the highest count with 20 deaths. However, as the risk in maternal mortality is demonstrably higher for women living in deprived areas, we can

[166] Also see the black maternity experiences survey: FIVEXMORE [accessed: 6 December 2022].
[167]Bunch and Knight (2022, p.16) note that this increase 'may be a reflection of increasing disadvantage, better recording of data or a combination of both'.
[168]As the information was 'missing' for between 4% and 9% in each of these categories, the figure may be higher (Bunch and Knight, 2022, p.16).
[169] Find the dataset here: https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Ffiles.digital.nhs.uk%2F0A%2F402A7B%2F05I_144DR1544_D.xls&wdOrigin=BROWSELINK [accessed: 15 November 2022].

conclude that women living in Liverpool and Knowsley and to a lesser extent, Halton, St. Helens and Wirral are at an increased risk, due to the high levels of deprivation in these areas (see section 2.5). Given that Liverpool also has the highest percentage of residents from an ethnic minority background (see section 2.2), we can conclude that women in Liverpool are most at risk, especially if they are both, from an ethnic minority background AND live in a an area of socio-economic deprivation.

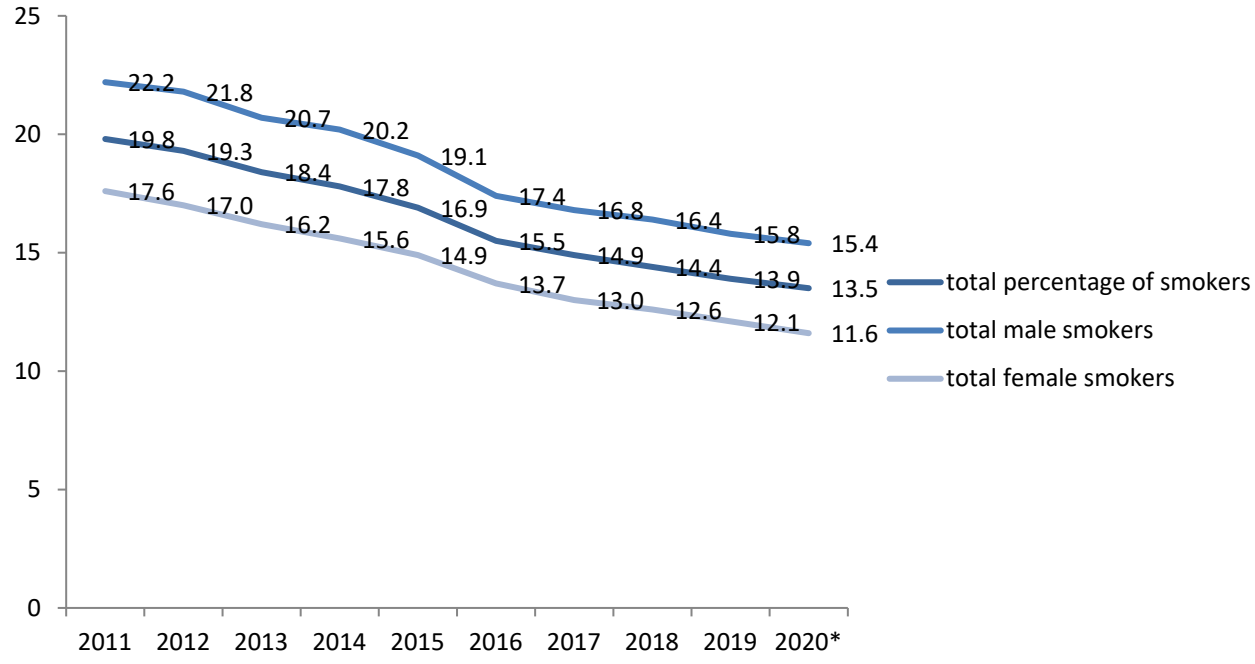
7. Lifestyle factors before, during and after pregnancy

7.1. Smoking: overall prevalence

The Office for Health Improvement and Disparities (2022b) highlights smoking as 'the leading preventable cause of illness and premature death, killing around 74,600 people in England in 2019'. Numerous severe illnesses have been associated with smoking. To name a few these include various cancers (e.g. lung, lip, mouth, throat, bladder, kidney, stomach, liver and cervix), respiratory disease and cardiovascular disease. Smoking reduces fertility, significantly raises the risk of developing type 2 diabetes, eye disease and dementia. Moreover, smoking is also closely associated with poor mental health and wellbeing. Smoking not only causes damage to smokers themselves but also to the people around them (especially infants and children) (Office for Health Improvement and Disparities, 2022b). OHID (2022b) notes that 'smoking is one of the main causes of health inequalities in England, with the harm concentrated in disadvantaged communities and groups'. OHID (2022b) therefore stipulates that 'every front-line health and care professional should: discuss smoking with their patients, routinely offer all smokers advice and support to quit smoking as part of routine care, deliver evidence-based interventions in accordance with NICE guidance'.

Ongoing campaigns and policies have over the years aimed at reducing the levels of smoking in the population, to some effect. Graph 21 highlights the continued decline in smoking prevalence since 2011(when 22.2% of the population smoked) among the total population of adults over 18 years of age. In 2019 an average of 13.9% of all adults in England still smoked (over 6 million people). The figure dropped to 13.5% in the first quarter (January to March 2020), the figure for entire year is still pending. There are differences in levels of smoking among the male and female population. In 2019, 12.1% of women smoked in comparison to 13.9% of men.

Graph 21: Total percentage of smokers, male and female over 18 in England (2011-2020)

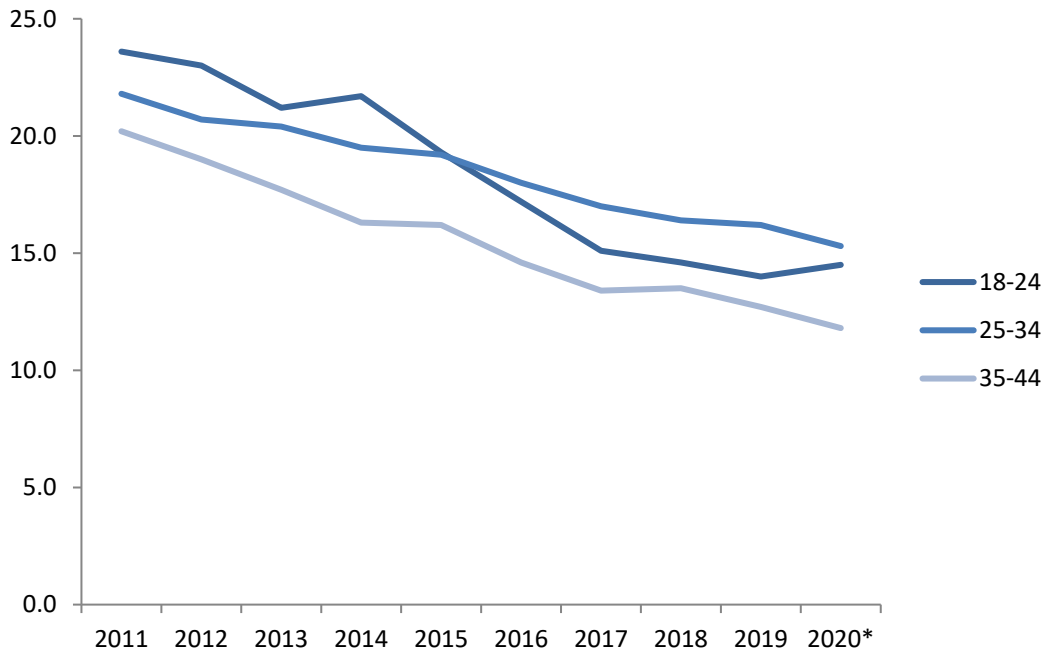


Source: Office for National Statistics, 'Dataset: Smoking habits in the UK and its constituent countries' (2011 to 2019 and Quarter 1 [Jan to Mar] 2020 edition of this dataset).[170] ** 2020 data is for Quarter 1 of that year only.*

Graph 22 demonstrates the different levels in smoking in women aged 18-44 and changes over since 2011. For all year groups smoking levels have decreased from 2011 to 2020. However, there has been an increase in the percentage of women that smoked among the 18-24 year olds to the previous year (from 14.0% to 14.5%); it remains to be seen whether this slight increase will level out when the data for the full year of 2020 become available. The highest percentage of smokers for the first quarter in 2020 was recorded for the age group 25-34 (15.3%) and the lowest 35-44 (11.8%). The percentages of smokers among women of both age groups had declined from the previous year, 16.2% and 12.7% respectively.

[170]Please find the dataset here: Smoking habits in the UK and its constituent countries - Office for National Statistics [accessed: 27 October 2022].

Graph 22: Proportion of women aged 18-44 who are current smokers, England



Source: Office for National Statistics, 'Dataset: Smoking habits in the UK and its constituent countries' (2011 to 2019 and Quarter 1 [Jan to Mar] 2020 edition of this dataset).[171] 2020 data is for Quarter 1 of that year only.

7.2. Smoking: at time of booking

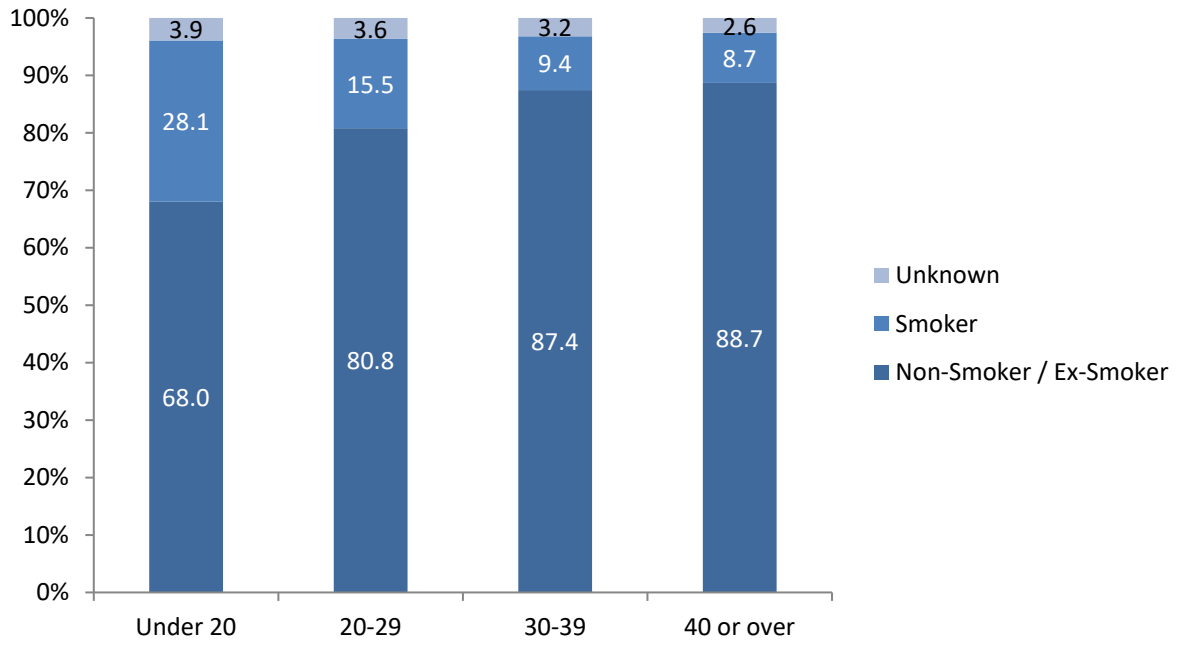
Apart from having a potential generally to harm a smoker's health, OHID (2022b) identifies smoking as 'the single most important modifiable risk factor in pregnancy'. This is because 'smoking is associated with a range of poor pregnancy outcomes including miscarriage, stillbirth, premature birth, neonatal complications, low birth weight and sudden infant death syndrome' (Office for Health Improvement and Disparities, 2022b). Still, nearly one in ten babies in England is born to women who smoked throughout pregnancy (9.6% in 2020/2021) (see section 6.3, below).[172] The current national data with regards to mothers' smoking status at the time of their booking appointment are available from the Maternity Services Monthly Statistics (published 27 October 2022) for July 2022. The data show that nationally, 11% of women with a recorded smoking status were smokers at the time of their booking appointment (92% of all women had a recorded smoking status).[173]

The most recent data (2020-2021) on the prevalence of smoking among women of different age groups at the time of their booking appointment (recorded at the time of birth) are

[171]Please find the dataset here: Smoking habits in the UK and its constituent countries - Office for National Statistics [accessed: 27 October 2022].
[172]Please find the NHS Digital 'Statistics on Women's Smoking Status at Time of Delivery: Data tables' here: https://digital.nhs.uk/data-and-information/publications/statistical/statistics-on-women-s-smoking-status-at-time-of-delivery-england/statistics-on-womens-smoking-status-at-time-of-delivery-england---quarter-4-2020-21/data-tables[accessed: 27 October 2022].
[173]See the Maternity Services Monthly Statistics here: Antenatal booking appointments - NHS Digital [accessed:1 November 2022].

available via NHS Digital via the NHS Maternity Statistics dataset. Graph 23 shows percentages of smokers, non-smokers and ex-smokers, and those for whom the status was unknown, for the cases of women where the relevant data was recorded and not marked as 'missing'. The data show that the percentage of smokers decreased with age; accordingly, the age group 'under-20'had the largest percentage of mothers who smoked at the time of birth(28.1%) and women over 40 the lowest percentage (8.7%).

Graph 23: Mother's smoking status at booking appointment and age group (2020-2021)



Source: NHS Digital, 'NHS Maternity Statistics, 2020-2021: Summary Report Tables'. [174]

Local data

The newest local data for the percentage of women who smoked in early pregnancy were for the years 2018/2019, based on the Maternity Services Dataset. The percentages varied considerably across the nine local authorities (see table 37, below). Liverpool (21.5%) had the highest percentage of women stating at their booking appointment that they smoked and also Knowsley and Halton had percentages that were significantly higher than the national average with 19.2% of women stating that each. Also Sefton (17.7%) and St. Helens (16.5%) had percentages well above the national average. Wirral (10.6%), Cheshire East (11.7%) and Warrington (11.8%) had percentage below the national figure.

Table 37: Smoking in early pregnancy (2018/2019)

Local Authority	Percentage of women smoking at booking appointment

[174]Find the NHS Maternity Statistics dataset 'NHS Maternity Statistics, 2020-2021:Summary Report Tables' here: https://digital.nhs.uk/data-and-information/publications/statistical/nhs-maternity-statistics/2020-21 [accessed: 27 October 2022].

Cheshire East	11.7
Cheshire West and Chester	13.9
Halton	19.2
Warrington	11.8
Knowsley	19.2
Liverpool	21.5
Sefton	17.7
St. Helens	16.5
Wirral	10.6
Cheshire & Merseyside LMS	*16.7*
England	***12.8***

Source: Office for Health Improvement & Disparities, Fingertips/ Public Health Data, 'Child and Maternal Health: Smoking in early pregnancy (2018/2019) '. Based on Maternity Services Dataset (MSDS) v1.5. [175]

7.3. Smoking at time of birth

Nationally, there has been a downward trend in the number and percentages of women who were recorded to be smoking at the time of birth. In 2010/2011, the national percentage was 13.6%; this decreased to 10.7% in 2016/2017 before a slight increase in 2017/2018 (10.8%). Since 2017/2018, the rate has seen a year-on-year decrease; the national percentage for 2020/21 was 9.6% and the provisional statistics for 2021/2022 indicate a further drop to 9.0%.[176] The table below shows the number and percentages of women who stated that they were smoking at the time of birth for the nine local authorities included in this needs' assessment. The indicator 'Smoking status at the time of birth' refers to numbers of mothers known to be smokers at the time of birth as a percentage of all maternities with known smoking status.

Local data

There is a significant variation between the local authorities in terms of the percentages of women who indicate that they smoked at the time of birth. The only authority with a percentage lower than the national percentage was Warrington (8.2%). Halton had the highest percentage (18.3%) - over double that of Warrington, followed by St. Helens (17.7%). The percentages for Knowsley (13.1%) and Wirral (12.1%) were also significantly above the national average.

[175] https://fingertips.phe.org.uk/profile/child-health-profiles/data#page/1/gid/1938133222 [accessed: 4 July 2022].

[176] See https://fingertips.phe.org.uk/profile/child-health-profiles/data#page/4/gid/1938133222/pat/159/par/K02000001/ati/15/are/E92000001/iid/93085/age/1/sex/2/cat/-1/ctp/-1/yrr/1/cid/4/tbm/1 [accessed: 28/07/2022].
Find data for 2021/2022 here:https://digital.nhs.uk/data-and-information/publications/statistical/statistics-on-women-s-smoking-status-at-time-of-delivery-england/statistics-on-womens-smoking-status-at-time-of-delivery-england-quarter-3-2021-22/data-tables [accessed: 28/07/2022].

Table 38: Smoking Status at the time of birth (2020/2021)

Local Authority	Number	Percentage of women smoking at birth
Cheshire East	292	10.8
Cheshire West and Chester	269	10.8
Halton	218	18.3
Warrington	152	8.2
Cheshire	*931*	-
Knowsley	234	13.1
Liverpool	575	11.3
Sefton	223	10
St. Helens	284	15.7
Wirral	339	12.1
Merseyside	*1655*	-
England	***51840***	***9.6***

Source: Office for Health Improvement & Disparities, Fingertips/ Public Health Data, 'Child and Maternal Health:Smoking Status at the time of delivery (2020/2021) '. Calculated by PHE from the NHS Digital return on Smoking Status at Time of delivery (SATOD).

7.4. Obesity: general and local population prevalence

Obesity is 'the most common medical condition in women of reproductive age' (Catalano and Shankar, 2017)and has been identified as a risk factor in pregnancy. Obesity in general 'is associated with reduced life expectancy and is a risk factor for a range of chronic diseases, including cardiovascular disease, type 2 diabetes, at least 12 kinds of cancer, liver, and respiratory disease, and can also impact on mental health' (Office for Health Improvement and Disparities, 2022e). The prevalence of obesity in adults is generally ascertained by relying on measures of heights and weights to calculate body mass index (BMI). With regards to pregnancies, a high BMI is associated with a number of short term and long term adverse consequences for mother and infant. It is linked to an increase in all pregnancy complications, including infertility, increased rates of miscarriage, fetal congenital abnormalities, fetal growth restriction, smaller babies, impaired glucose tolerance and gestational diabetes, hypertensive disorders of pregnancy, difficulty monitoring the baby, still birth and maternal death. There is also an increased risk of caesarean birth and wound complications. After birth, there is an increased risk of venous thromboembolism, depression, and difficulty with breast feeding. Postpartum weight retention increases future cardiometabolic risks and pre-pregnancy obesity in subsequent pregnancies. Additionally, infants born to women with a high BMI during pregnancy have increased body fat at birth, which increases the risk of childhood obesity(Lewis et al., 2016, p.44; Catalano and Shankar, 2017).The pandemic has had a disproportionate effect on obese people. Obesity increased the risk of being hospitalised, admitted to intensive care, and of dying from Covid-19, prompting an increased focus on obesity reduction (NHS Digital, 2020b). Whilst this section focuses on the prevalence of 'obesity' in the population as a whole and our target population of women aged of 16-44, the following section (section 7.5) focuses specifically on obesity during pregnancy.

According to the Office for Health Improvement and Disparities (2022e) – OHID, the Health Survey for England data provide the best indicator of obesity prevalence for adults. However, due to the Covid-19 pandemic the sample size of the latest survey (which was conducted 2019) was not big enough to produce robust local level estimates. As the possibility for conducting the survey was impacted by the pandemic, the latest available data is from 2019.[177] Therefore, OHID currently uses the data collected by the Active Lives Adult Survey conducted by Sport England to produce estimates of adult excess weight prevalence for the Public Health Outcomes Framework.[178] The data show that the overall percentage of adults in England aged 18 and over which are 'obese' (a BMI greater than or equal to 30kg/m²) was 25.3% in November 2020 to November 2021, this is an increase from 24.4% in 2019- 2020 and 22.7% in 2015-2016.[179] Moreover, the adult population whose BMI indicates that they were 'overweight or obese' (a BMI greater than or equal to 25kg/m2) was 63.5%; this percentage has slightly but steadily increased from 2015-2016 when the percentage was 61.4%.

Local data

There was a large variation in the prevalence of adult obesity across upper tier local authorities in England in 2020-2021, ranging from 10.5% in Westminster to 40.3% in Knowsley. Table 39 shows the percentages of the population of adults aged 18 and over who were estimated to be 'obese' or 'overweight and obese' in 2020-2021 for the local authorities subject of this JSNA. As noted, Knowsley had the highest percentage of the population who were defined as 'obese' of all national local authorities. Five further local authorities had percentages higher than the England average, and only Cheshire East (18.3%), Cheshire West and Chester (23.7%) and Sefton (24.4%) had lower percentages.

Table 39: Percentage of 'obese' or 'overweight and obese' population per local authority (2020-2021)

Local Authority	Percentage of population with BMI>=30kg/m2)	Percentage of population with BMI greater than or equal to 25kg/m2)
Cheshire East	18.3	68.3
Cheshire West and Chester	23.7	60.2
Halton	32.3	65.0
Warrington	26.1	64.2
Knowsley	40.3	74.0
Liverpool	29.2	65.9
Sefton	24.4	71.5

[177] Find the survey data and the dataset here: Health Survey for England - NHS Digital [accessed: 26 October 2022].

[178] The Survey collects data on self-reported height and weight among adults aged 18 years and over in Local Authority areas across England. The data is adjusted at an individual level to better align with measured height and weight and then age standardised to improve comparability between local authorities(Office for Health Improvement and Disparities, 2022d).

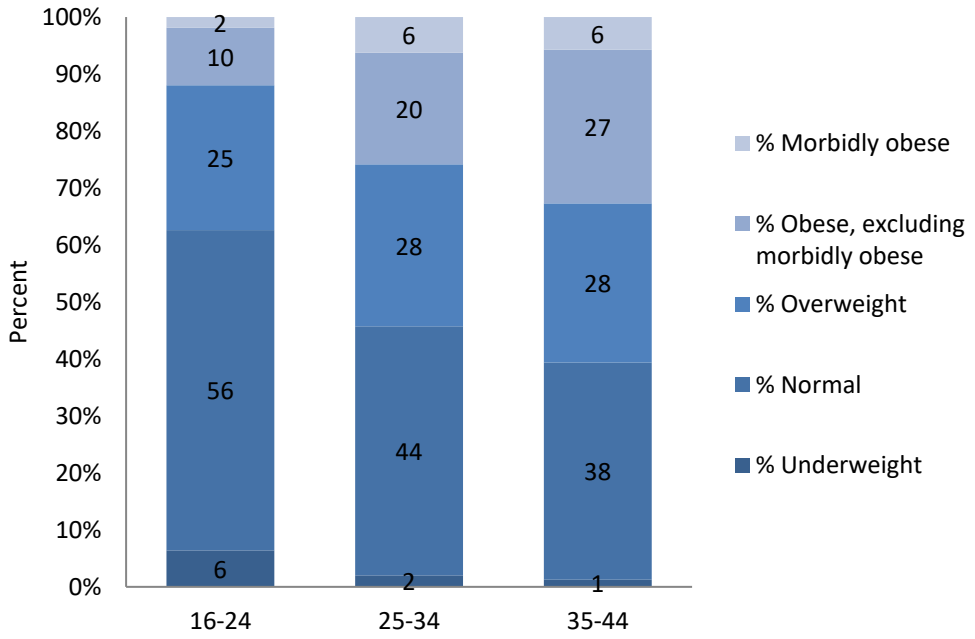
[179] Available via NHS Fingertips Public Health Data: Obesity Profile - Data - OHID (phe.org.uk) [accessed: 26 October 2022].

St. Helens	34.9	67.6
Wirral	27.3	71.8
England	***25.3***	***63.5***

Source: Office for Health Improvement & Disparities, Fingertips/ Public Health Data, 'Obesity Profile' (2020/2021). Based on the Active Lives Adult Survey, Sport England.[180]

The OHID Public Health Datasets show that there is a variation in obesity levels among women and men, and different age groups. However, the Active Lives Adult Survey data a liable via the Fingertips Public Health Data is difficult to correlate. We therefore draw on data from the Health Survey for England (HSE) 2019 to highlight this variation for women aged 16-44.[181] As graph 24 demonstrates, the percentage of women who are classified as 'overweight' (BMI≥25kg/m2) is relatively constant across all ages (25% for the age group 16-24, and 28% for the age groups 25-34 and 35-44). The percentage of women who are classified as 'obese' (BMI>=30kg/m2) increases with age; from 12% for the age group 16-24, to 26% for the age group 25-34%, and 33% for women aged 35-44. Notably, 6% of the women aged 25-44 are classified as 'morbidly obese' (BMI≥40kg/m2).

Graph 24: Prevalence of underweight, normal, overweight, obese, and morbidly obese weight for women ages 16-44, England (2019)



Source: NHS Digital (2020), 'Health Survey for England 2019: Overweight and obesity in adults and children data tables' – table 4'.[182]

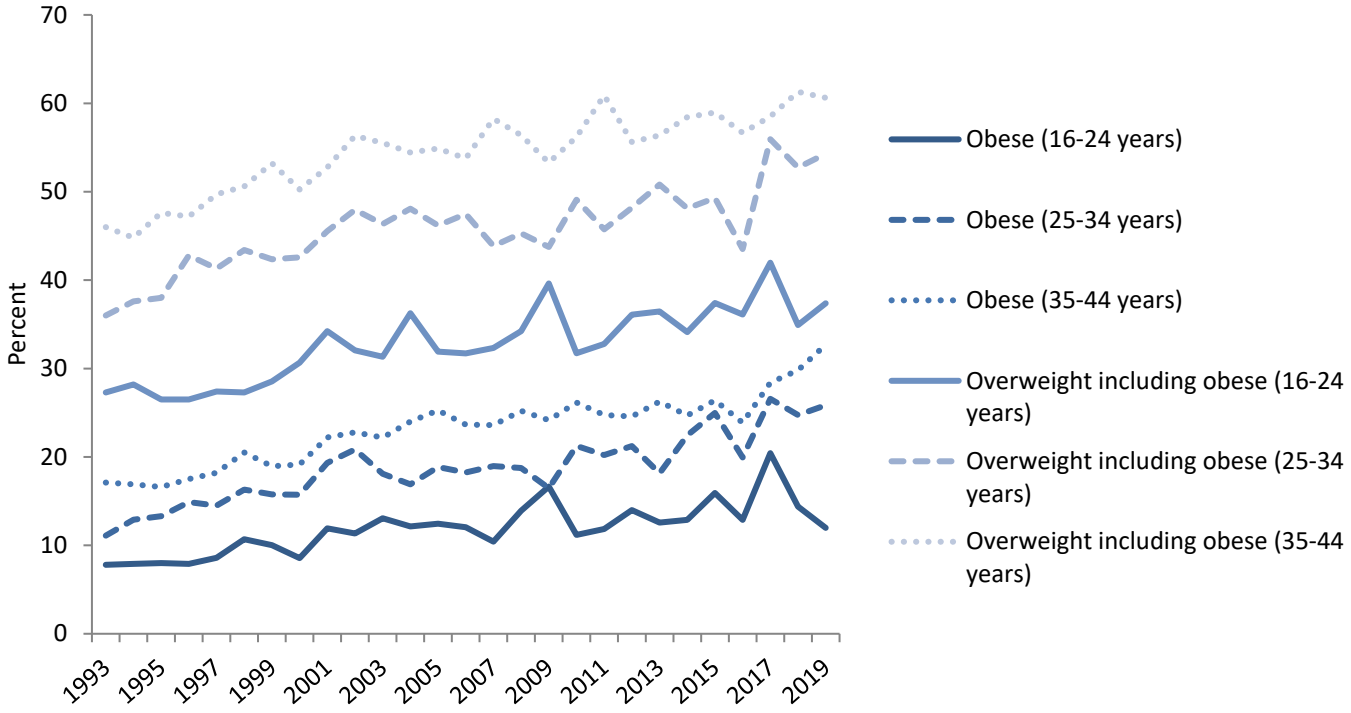
[180]Available via NHS Fingertips Public Health Data: Obesity Profile - Data - OHID (phe.org.uk) [accessed: 26 October 2022].

[181]Find the dataset 'Health Survey for England, 2019: Overweight and obesity in adults and children data tables' here: https://digital.nhs.uk/data-and-information/publications/statistical/health-survey-for-england/2019/health-survey-for-england-2019-data-tables [accessed: 26 October 2022].

[182]Find the dataset here: https://digital.nhs.uk/data-and-information/publications/statistical/health-survey-for-england/2019/health-survey-for-england-2019-data-tables [accessed: 25 October 2022].

Graph 25 demonstrates that there has been a general upwards trend in obesity levels among women aged 25-44 since 1993. For the age group 16-24, however, the rate has fluctuated over the years. In 2019, the rate dropped significantly from 20% in 2017 to 14% in 2018, to 12% in 2019. However, the HSE data shows that the percentage for women who are 'overweight or obese' has also seen a steady increase in this age group, from 27% in 1993 to 37 % in 2019. In that time period the percentage for the age group 25-34 increased from 36% to 54%, and for the age group 35-44 from 46% to 61% (see HSE data table 3).

Graph 25: Trends in obesity among women aged 16-44 for England (1993-2019)



Source: NHS Digital (2020), 'Health Survey for England 2019: Overweight and obesity in adults and children data tables' – table 3'.[183] *Please note: Data up to and including 2002 are unweighted; from 2003 onwards data have been weighted for non-response.*

Obesity levels vary across the population also according to other socio-economic factors (e.g. level of education, working status, socioeconomic class, levels of deprivations) and reflect other societal inequalities. The Active Lives Adult Survey (2020-2021) data are the most recent data available which highlight these inequalities in England. Here we concentrate on levels of deprivation, 'class' and ethnicity:

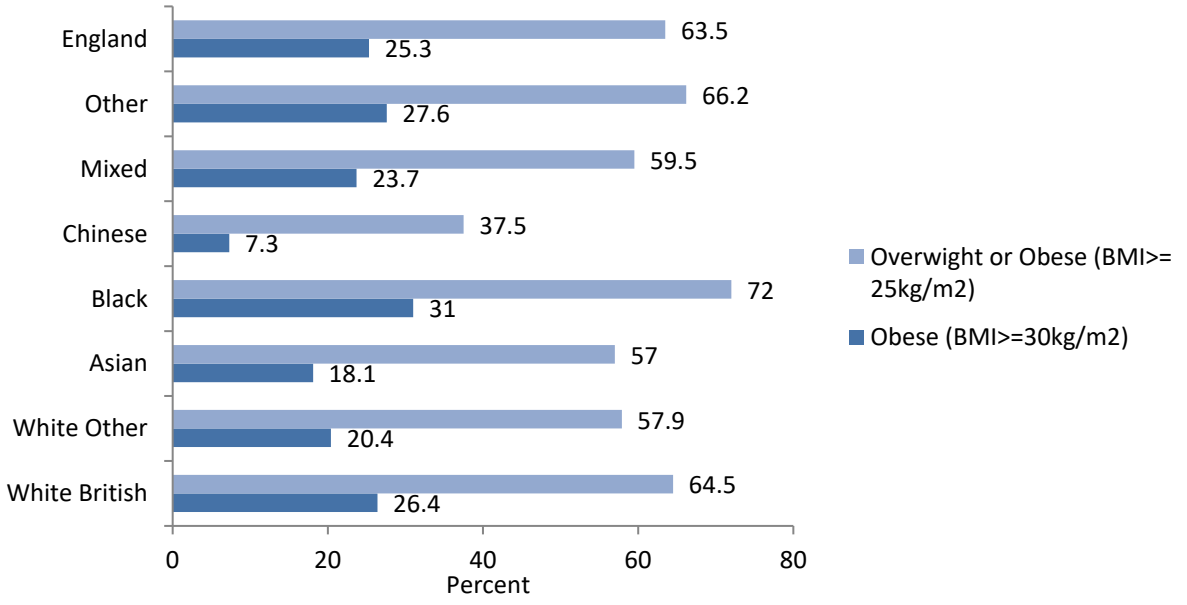
- *Levels of deprivation*: Firstly, there are clear disparities in the prevalence of obesity with regards to levels of deprivation. The percentage of the population classified as 'obese' decreased gradually from 36.8 % of the population who live in the most deprived decile to 19.2% who live the least deprived decile.[184]

[183]Find the dataset here: https://digital.nhs.uk/data-and-information/publications/statistical/health-survey-for-england/2019/health-survey-for-england-2019-data-tables [accessed: 25 October 2022].
[184] See: Obesity Profile - Data - OHID (phe.org.uk) [accessed: 27 October 2022].

- Socio-economic classification: Secondly, there are differences according to a person's national statistics socio-economic classification (NS-SEC). Obesity levels were highest among people classified as 'long term unemployed or never worked' (32.0%), followed by people working in 'semi-routine and routine occupations' (27.4%) and people working in 'lower supervisory and technical occupation' (26.8%). They were lowest among people in 'managerial, administrative and professional occupations' (20.3%) and the 'self-employed and small employers (21.4%).

- *Ethnicity:* There are also disparities in obesity prevalence by ethnic group. Graph 26 shows that adults from black and white British ethnic groups have a higher prevalence compared with the England value (31.0% and 26.4% respectively). The prevalence of obesity among people from the Asian ethnic groups (18.1%) is lower than the overall England value. However, whilst the data presented in the OHID Obesity Profile uses the same BMI thresholds for all adults, the Office for Health Improvement and Disparities (2022e) notes that 'guidance from the National Institute for Health and Care Excellence (NICE) states that lower BMI thresholds should be used in adults from some black, Asian and other minority ethnic groups to trigger actions to prevent conditions such as type 2 diabetes' .

Graph 26: Prevalence of 'obesity' or 'overweight and obesity' according to ethnic group (2020-2021)



Source: Office for Health Improvement & Disparities, Fingertips/ Public Health Data, 'Obesity Profile' (2020/2021). Based on the Active Lives Adult Survey, Sport England.[185]

[185]Available via NHS Fingertips Public Health Data: Obesity Profile - Data - OHID (phe.org.uk) [accessed: 26 October 2022].

7.5. Obesity at time of booking/during pregnancy

Local data

As noted, obesity in pregnancy carries significant health risks. The latest data on obesity in early pregnancy are available for the year 2018/2019. Table 40 provides percentages for pregnant women who are obese (BMI>=30kg/m2) at the time of booking across most of the local authorities, which the exception of Cheshire East and Warrington (as there was no data available). Cheshire West and Chester had the lowest level of obesity among women in their early pregnancy (21.1%), followed by Sefton (21.8%), both were below the average for England that year (22.1%). All other local authorities had levels higher than the England average, with Halton having the highest percentage (29.1%), followed by Wirral (26.4%) and St. Helens (25.8%).

Table 40: Obesity in early pregnancy (2018/2019)

Local Authority	Percentage of women with BMI>=30kg/m2 at booking
Cheshire East	-
Cheshire West and Chester	21.1
Halton	29.1
Warrington	-
Knowsley	24.7
Liverpool	22.9
Sefton	21.8
St. Helens	25.8
Wirral	26.4
Cheshire & Merseyside LMS	*23.6*
England	***22.1***

Source: Office for Health Improvement & Disparities, Fingertips/ Public Health Data, 'Child and Maternal Health: Obesity in early pregnancy (2018/2019) '. Based on Maternity Services Dataset (MSDS) v1.5.[186]

7.6. Diabetes: general population prevalence

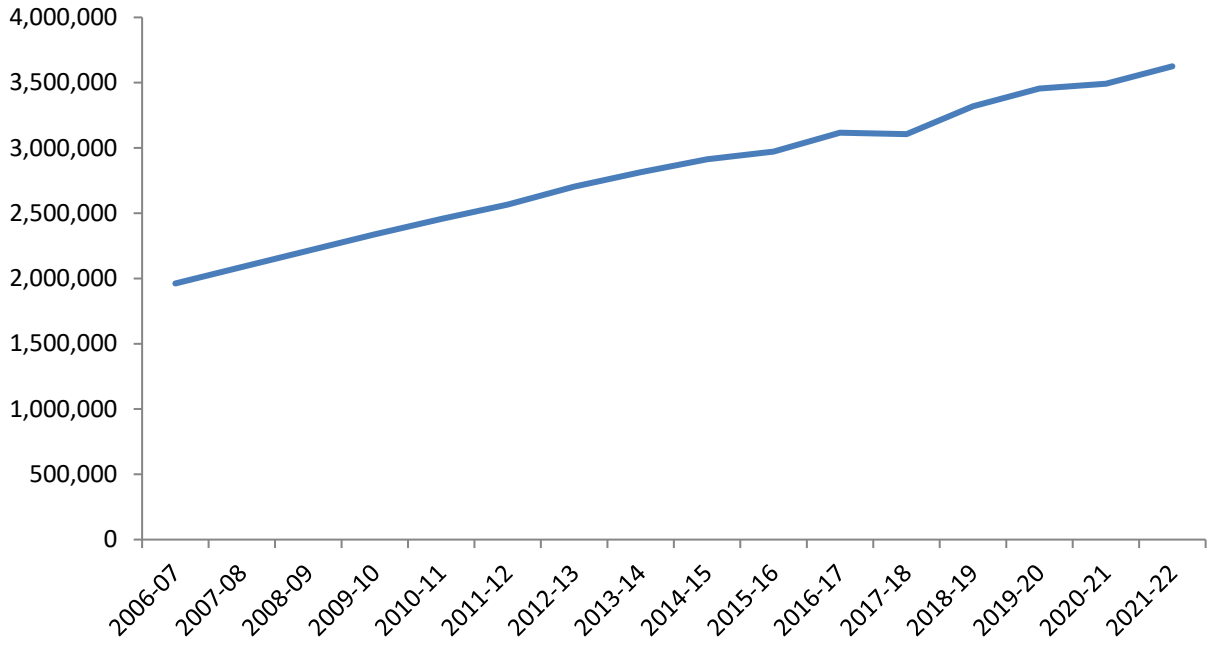
The most common types of diabetes are Type 1 and Type 2. Both illnesses have commonalities, as they belong to a groups of metabolic disorder called diabetes mellitus 'in which persistent hyperglycaemia (random plasma glucose more than 11.1 mmol/L) is caused by deficient insulin secretion, resistance to the action of insulin, or both.[...] [This leads] to the abnormalities of carbohydrate, fat, and protein metabolism that are characteristic of diabetes mellitus' (NICE, 2022b, also see Mayer-Davis et al., 2018). Diabetes UK summarises the difference between the two types as follows: type 1 diabetes is a genetic condition that often shows up early in life; the immune system itself disrupts the body's insulin production.

[186]https://fingertips.phe.org.uk/profile/child-health-profiles/data#page/1/gid/1938133222 [accessed: 4 July 2022].

In contrast, type 2 is mainly lifestyle-related and develops over time.[187] In the case of gestational diabetes, hyperglycaemia develops during pregnancy and usually resolves after birth, although the woman is at increased risk for overt type 2 diabetes in the future(NICE, 2022b).

In line with a global trend, the number of adults diagnosed with diabetes in England has increased sharply over the past two decades. Yearly national data with regards to disease prevalence among patients of 17 years and older is available via the Quality and Outcomes Framework (QOF).[188] QOF data (graph 27, below) show that the number of patients registered with diabetes mellitus via GP practices from 1 April 2021 to 31 March 2022 UK was 3,625,401, nearly double the figure of 1,766,391 recorded for 2004-2005 (the year QOF was first conducted). The percentage of patients with diabetes also more than doubled in those years from 3.34% to 7.26% a further increase from 7.11% in the previous year.

Graph 27: Overall prevalence of diabetes mellitus in GP registered patients in England (2006-2022)



Source: NHS Digital 'Clinical National Quality Outcomes Framework'. Data taken from successive years since 2006.[189]

The most up-to-date data that allow differentiation of disease prevalence according to gender, levels of deprivation and ethnicity, are available through the National Diabetes

[187] For more details see Differences between type 1 and type 2 diabetes | Diabetes UK [accessed: 2 November 2022].

[188]The QOF was first introduced in 2004 and provides financial incentives to general practices for the provision of high-quality care. Participation by practices in the QOF is voluntary but most practices choose to participate. Find the Quality and Outcomes datasets for successive years here: Quality and Outcomes Framework - NHS Digital [accessed: 2 November 2022]. Newer data (from is available through the QOF dashboard: Microsoft Power BI, older datasets (2014-2015 & 2015-2016) are available through the NHS Digital archive; NHS Digital - Publishers - NHS England Data Catalogue [accessed: 2 November 2022].

[189] Find the Quality and Outcomes datasets for successive years here: Quality and Outcomes Framework - NHS Digital [accessed: 2 November 2022].

Audit Quarterly Report (January 2021 to March 2022).[190] In terms of disease prevalence, out of a total of 3,553,885 patients registered with diabetes, diabetes type 1 accounted for 7.25% (257,635 registrations) and 92.75% for diabetes 'Type 2 and other' registrations. With regards to the gender distribution of patients registered with type 2 diabetes and other forms of diabetes, of a total of 3,296,250, 55.6% were men and 44.4% were women. Under-40 year olds made up the lowest percentage of the total number of patients diagnosed with type 2 diabetes (4.2%), and the age group 40-64 the largest (43.6%).

Considering the demographic of interest to this JSNA, women of childbearing age, it is important to highlight some of the specific aspects affecting diabetes type two sufferers in the age-group under forty. As noted, the numbers among younger age groups are the lowest but they have been rising,[191] which was one of the main reasons for NHS Digital to publish the first Young People with Type 2 Diabetes report (2019-2020) in 2021.[192]The report (2021b) found that in 2019-2020 there were 122,780 children and young adults under the age of 40 years with type 2 diabetes (around 1.3% were under 19 years old). Compared with people aged 40 years and over who have type 2 diabetes, people under the age of 40 were more likely to be female, of minority ethnicity (particularly Asian), be living in an area of social deprivation and be classified as overweight or obese.[193] Nevertheless, these risk factors reflect the general risk factors for type 2 diabetes, which are:

- *Obesity*: This is the risk factor most closely associated with type 2 diabetes. Obesity accounts for 80–85% of the overall risk for developing type 2 diabetes (Diabetes UK, 2019). Being overweight or obese is often linked to overeating and inactivity, which can exacerbate insulin resistance(NICE, 2022a).

- *Family history*: The likelihood of developing type 2 diabetes is around 15% when one parent already has the illness, rising to 75% if both have diabetes type 2 (Diabetes UK, 2020; NICE, 2022a).

- *Diet*: A diet that is low in fibre and incorporates many foods with a high in glycaemic index (GI) may increase the risk of being overweight or obese and thus increase the

[190]The report provides provisional England, Clinical Commissioning Group (CCG) and GP practice level data for that period. The report records separate data for 'diabetes type 1' and 'type 2 and other' types of diabetes. Find the National Diabetes Audit Quarterly Report (January 2021 to March 2022) here: National Diabetes Audit - NHS Digital [accessed: 2 November 2022].

[191]A recent newspaper article that references information obtained from Diabetes UK, states that 'the number of people under 40 in the UK being diagnosed with type 2 diabetes is rising at a faster pace than the over-40s [...] [which] experts say exposes the impact of soaring obesity levels. [...]. The number of people under 40 in the UK diagnosed with type 2 diabetes has jumped 23% from about 120,000 in 2016-17 to 148,000 in 2020-21 [representing] a faster growth rate than the rise in cases among over-40s, who still make up the vast majority of cases' (The Guardian, 2022).

[192]The Young People with Type 2 Diabetes report (2019-2020) combines data from the National Diabetes Audit and the National Paediatric Diabetes Audit (NPDA). The reasoning behind this separate report is that 1) it is thought that the percentage of under-40 year old diabetes type two sufferers is increasing and 2) because younger people who develop the condition face more adverse diabetes and cardiovascular outcomes than other groups. Find the report and corresponding dataset here: Young People with Type 2 Diabetes, 2019-20 - NHS Digital [accessed: 3 November 2022].

[193]Moreover, compared with people aged 40 years and over, people aged 19 to 39 years were less likely to have all annual care processes and an HbA1c less than or equal to the NICE standard of 58mmol/mol (7.5%).

risk of diabetes. Moreover, foods with a high GI index contain carbohydrates that are broken down quickly and cause a rapid increase in blood glucose levels, or spikes,(NICE, 2022a) which especially in combination with a diet low in fibre, has been found to increase the risk of type 2 diabetes (Bhupathiraju et al., 2014).

- *History of gestational diabetes*: Women with a history of gestational diabetes have a seven-fold increased risk for developing type 2 diabetes later in life. Children born to mothers with gestational diabetes have a six-fold increased risk for developing type 2 diabetes (NICE, 2022a).

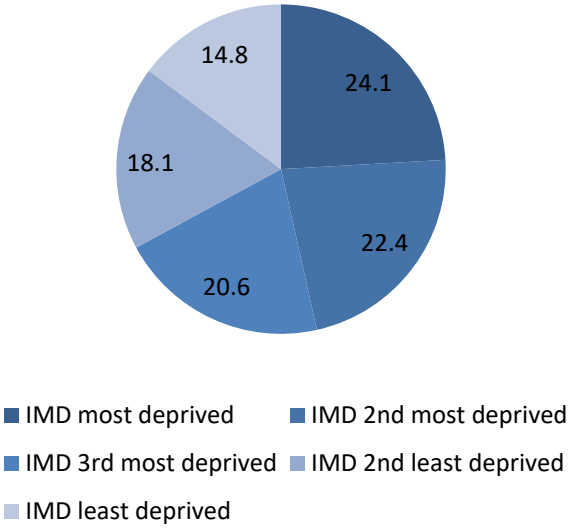
- *Ethnicity*: People of Asian, African, and Afro-Caribbean ethnicity are 2–4 times more likely to develop type 2 diabetes than those how self-identify as 'white' (Diabetes UK, 2020; NICE, 2022a). Reasons for this are unclear; however, people from Black African, African Caribbean and South Asian backgrounds are at risk of developing type 2 diabetes from the age of 25 in contrast to people from a 'white' background, where the risk increases from 40.[194]The National Diabetes Audit Quarterly Report figure for January 2021 to March 2022 (graph 29) show that people who self-identified as 'White' made up the highest percentage (70.5%) of patients registered with 'type 2 or other' diabetes, followed by people who identified to be from a 'minority ethnic background' (22.8%).[195]As the above-mentioned increased risk for people of Asian, African, and Afro-Caribbean ethnicity indicates highlights,it would be useful to break down the data further and to weight it by considering the ethnic make-up of the population as a whole to allow for a more in-depth analysis of the link between diabetes and ethnicity,

- *Levels of deprivation:* When it comes to a distribution according to the level of deprivation a patient lived in, the percentages for type 1 diabetes were fairly evenly distributed from the most deprived quintile to the 2nd least deprived, with each quintile making up around 20% (the least deprived quintile had the lowest percentage with 19.3%). In contrast, the percentages of patients registered with 'Type 2 and other' diabetes decreased from quintile to quintile – patients lining in the most deprived area had the highest percentage (24.1%) and the least deprived the lowest (14.8%) (see graph 28).

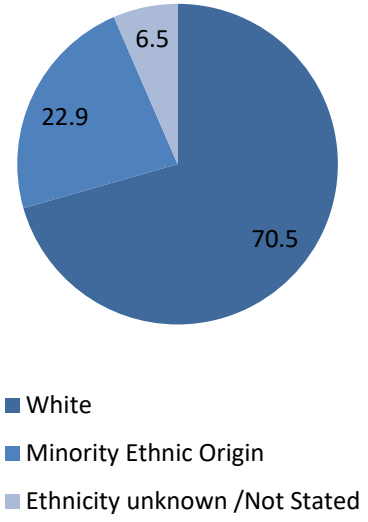
[194]See Diabetes UK 'Ethnicity and type 2 diabetes | Preventing diabetes | Diabetes UK [accessed: 2 November 2022].

[195]Find the National Diabetes Audit Quarterly Report (January 2021 to March 2022) here: National Diabetes Audit - NHS Digital [accessed: 2 November 2022].

Graph 28: Patients registered with diabetes 'type 2 and other' by level of deprivation (%) (2021-2022)



Graph 29: Patients registered with diabetes 'type 2 and other' by ethnicity (%) (2021-2022)



Source: NHS Digital (2022), 'Type 2 and other' in the National Diabetes Audit 2021-22 Quarterly Report (January 2021 to March 2022).[196]

- *Other*: Receiving certain drug treatments, polycystic ovary syndrome and low birth weight and pre-term birth are also risk factors for developing type 2 diabetes (NICE, 2022a).

Local data

Table 39 provides a breakdown of the percentages of women with diabetes type 1 and type 2 and other among the general population diagnosed with the conditions, as well as the percentages of under-40-years-olds across the nine CCGs focus of this JSNA. The data show that only NHS Liverpool CCG (4.5%) had a percentage of diabetes type two registrations for under-40-year olds that was higher than the national average (4.2%). It also had the highest percentage for people under forty diagnosed with diabetes type 1 (54.6%). NHS Southport and Formby CCG (38.5%), NHS Cheshire CCG (44.8%) and HNS Warrington CCG and NHS Wirral CCG (both 44.9%) had lower percentages than the national average.

Table 41: Diabetes (type 1, type 2 and other) prevalence in local CCGs among women and under 40s (2021-2022)

CCGs	Type 1			Type 2 and other		
	total count	women (%)	under 40 (%)	total count	women (%)	under 40 (%)
NHS Cheshire	3,640	43.3	44.8	40,470	43.2	3.0

[196] Find the dataset ' here: National Diabetes Audit 2021-22 Quarterly Report January 2021 to March 2022.xlsx (live.com) [2 November 2022].

NHS Halton	660	40.9	51.5	8,090	44.9	3.8
NHS Knowsley	830	42.2	49.4	9,705	44.5	4.1
NHS Liverpool	2,455	43.0	54.6	28,020	44.5	4.5
NHS Southport and Formby	585	42.7	38.5	7,045	43.6	2.4
NHS South Sefton	755	45.0	49.7	8,800	44.6	3.6
NHS St. Helens	1,020	44.1	47.5	11,965	43.8	3.7
NHS Warrington	1,080	42.6	44.9	11,650	44.0	3.7
NHS Wirral	1,605	42.4	44.9	18,410	43.5	3.5
England	***257,635***	***43.5***	***45.5***	***3,296,250***	***44.4***	***4.2***

Source: NHS Digital (2022), 'Type 1' and 'Type 2 and other' in the National Diabetes Audit 2021-22 Quarterly Report (January 2021 to March 2022).[197]

7.7. Diabetes: type 1, type 2 and gestational

Women who have type 1 or type two diabetes are at an increased risk of certain pregnancy complications, these include having a miscarriage and having a large baby, which in turn increases the likelihood of needing to be induced or giving birth via a caesarean section. Pregnancy may also exacerbate conditions related to diabetes, such as diabetic retinopathy and diabetic nephropathy, or for women with type 1 diabetes diabetic ketoacidosis. For the infant there is an increased risk of stillbirth or neonatal death, and being born with birth defects (especially heart and nervous system abnormalities). Infants born to mothers with diabetes may have health problems shortly after birth, such as heart and breathing problems and/ or face obesity or diabetes in the longer term.[198] NICE guideline [NG3] (2015)thus recommends a careful management of diabetes during pregnancy to reduce these risks, recommendations which are also reflected NHS advice to women with regards to diabetes and pregnancy.[199]

The latest data on women with diabetes and pregnancy for England and Wales are available through the National Pregnancy in Diabetes Audit (NPID)(NHS Digital, 2021a), an audit which has been running since 2014. The latest audit includes data collected from January 2019 to December 2020. According to the audit, 44.4%of pregnant women with diabetes in England and Wales in 2019/2020 had type 1 diabetes (a drop from 51.3% in 2014) and 54% had type 2 diabetes (47% in 2014), nearly double the percentage recorded for 2002-2003 (27%).In the cases of a small percentage (1.4%) the type of diabetes was recorded as 'Other/ not known'.[200]

In terms of demographics, the audit reported that women with type 2 diabetes were older (a median age of 34), had a shorter duration of diabetes (a median duration of 3 years) and had higher BMI (a median BMI of 32.7) than women with type 1 diabetes. The median age for women with type 1 diabetes was 30, the median duration of their diabetes 14 years and

[197]Find the dataset ' here: National Diabetes Audit 2021-22 Quarterly Report January 2021 to March 2022.xlsx (live.com) [accessed: 2 November 2022].

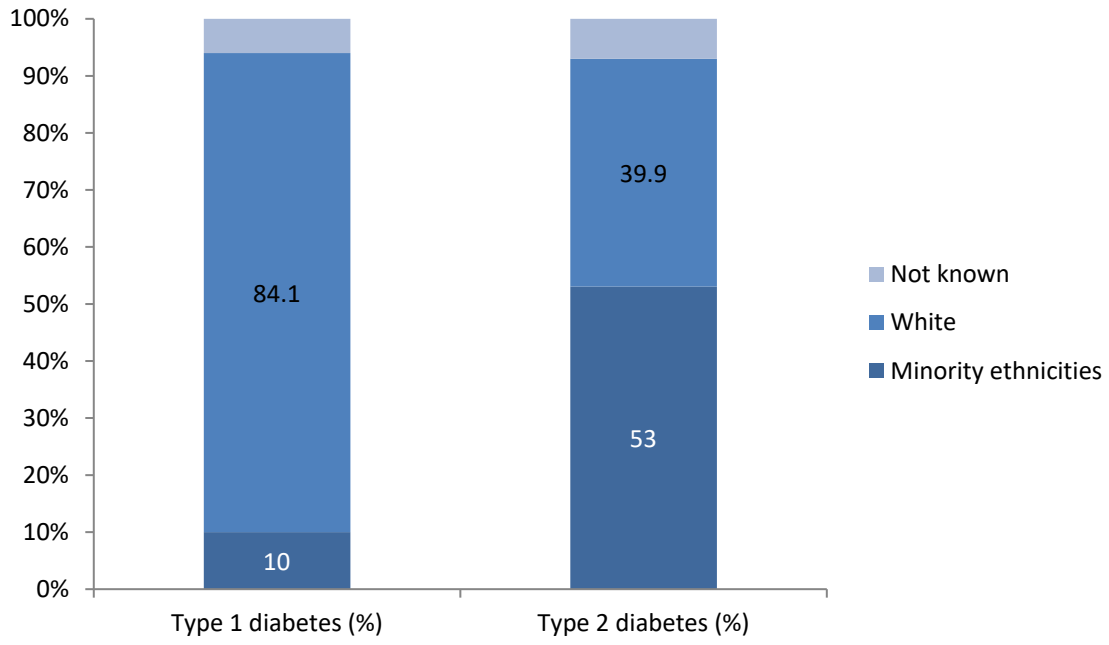
[198] See the NHS information on Diabetes and pregnancy - NHS (www.nhs.uk) [accessed: 27 October 2022].

[199] E.g. Diabetes and pregnancy - NHS (www.nhs.uk) [accessed: 27 October 2022].

[200] Find the corresponding dataset here: National Pregnancy in Diabetes Audit 2020 Supporting Information.xlsx (live.com) [accessed: 27 October 2022].

their median BMI at the time of booking was 26. Women with type 2 diabetes were also more likely to be of minority ethnic background (53%) (see graph 30) and/or come from a deprived area (40.5% from the most deprived quintile).

Graph 30: Ethnicity by diabetes type (2020)



Source: NHS Digital, ': National Pregnancy in Diabetes Audit 2020: Supporting Information'.[201]

The audit collects data which seek to shed light on the following questions: 1)were women adequately prepared for pregnancy? 2) Were adverse maternal outcomes minimised? And 3) were adverse fetal/infant outcomes minimised? NICE(2015) guideline [NG3] recommends that women with diabetes prepare for pregnancies in order to counteract possible adverse outcomes. The audit defines 'well prepared' for pregnancy as 'early pregnancy HBA1c <48 mmol/mol, taking 5mg folic acid and not taking any potentially harmful medications'.[202] The recommendation to take folic acid is to counteract an increased risk of a neural tube defect during pregnancy among women with diabetes. NICE (2015) recommends that women take 5mg of folic acid whilst planning pregnancy and up to 12 weeks' gestation. The recommendation for women with diabetes to keep their HbA1c level below 48 mmol/mol, if this is achievable without causing problematic hypoglycaemia prior to and during pregnancy, aims to reduce the risk of miscarriage, congenital anomalies, stillbirth and neonatal death.

The NPID (NHS Digital, 2021a) found that over the years, the percentage of women who are well prepared for pregnancy has not greatly improved. For women with type 1 diabetes it

[201]Find the corresponding dataset here: National Pregnancy in Diabetes Audit 2020 Supporting Information.xlsx (live.com) [accessed: 27 October 2022].
[202] Find the Glossary for the National Pregnancy in Diabetes Audit here: https://files.digital.nhs.uk/59/A25635/National%20Pregnancy%20in%20Diabetes%20Audit%202020%20Glossary.pdf [accessed: 3 November 2022].

improved only one percentile since audit 2014-2018 to 2020 – from 12.7% to 13.5%. The percentage of women with diabetes type 2 who were well prepared actually decreased in that time period, from 12.1% to 11.4%. The percentage of 'well prepared' women decreased significantly in line with the level of deprivation that women lived in (from 20.9% in the least deprived quintile to 6.5% in the most deprived quintile for women with diabetes type 1, and 22.2% to 9.2% for women with diabetes type 2). There were also differences in the level of preparation with regards to a woman's ethnicity. Women who self-identified as 'Black' had the lowest level of preparation among both women with diabetes type 1 and type 2. The percentage of 'Black' women with type 1 diabetes who were well prepared was 6.5%– compared to the highest percentage 15.2% for women who self-identified as 'Asian'; 12.9% being the average across all women. The level of preparation among 'Black' women with type 2 diabetes was 7.3%, compared to 14.3% among women who self-identified as 'White' and 11.8% across all women. In their audit report, NHS Digital (2021a) therefore concludes that 'current approaches to pregnancy preparation are not working for most women with diabetes, particularly Black women and women living in more deprived communities'. They further concluded that 'there was no overall improvement in pregnancy preparation between first and subsequent pregnancies, further emphasising that current healthcare system approaches are not working for most women with type 1 and type 2 diabetes'.

Regional and local data

Sub-national data with regards to individual antenatal diabetes services and regional performance on key indicators are available via the dataset 'National Pregnancy in Diabetes Audit: Service Level Analysis 2018-20 - England and Wales'.[203] The data show that pregnant women with diabetes type 1 in the North West of England reached pregnancy completion at a slightly lower average age (29 years) than England and Wales, but the median age of women with diabetes type 2 was the same as the national average (34 years). Similarly women with diabetes type 1 in the North West had a slightly shorter duration of diabetes (a median of 13 years) than the average for England and Wales (14 years), whilst the median duration for women with diabetes type 2 was the same as the England and Wales average (3 years). The median body mass index for women with both types of diabetes in the North West was similar to that of women in England and Wales in general (type 1: BMI =26; type 2: BMI = 32.7).

Table 42 (below) contains data for a small number of key measures which shed some light on the level of pre-pregnancy preparation and the level of adverse maternal and fetal/ infant outcomes for three hospitals within the footprint covered by this JSNA, as well as the North West of England. Other hospitals within the footprint either did not submit data, or did not record ten or more completed pregnancies (by women with any diabetes type) in the three-year period covered by the dataset (2018-2020). Table 40 shows that in the North West of England 29.2%of women took a folic acid supplement before pregnancy; this is lower than the average for England and Wales (31.2%). With regards to the three hospitals, two had lower than the England and Wales average. Women registered in the Countess of

[203] Find the dataset 'National Pregnancy in Diabetes Audit: Service Level Analysis 2018-20 - England and Wales' here: https://digital.nhs.uk/data-and-information/publications/statistical/national-pregnancy-in-diabetes-audit/2019-and-2020 [accessed: 5 November 2022].

Chester Hospital had the lowest percentage with 18.2% and Liverpool Women's Hospital (28%). In contrast, a significantly higher proportion of women registered at Warrington Hospital took folic acid prior to pregnancy (37.5%). Notably, there was a large variation in women's folic acid use prior to pregnancy across all participating hospitals in England and Wales, from 5.9% in North Middlesex Hospital to 61.1% in Derriford Hospital.

Table 42 also contains data on the proportion of women that met the NICE target of establishing good glycaemic control (HbA1c <48 mmol/mol) within the first trimester and the third trimester. Overall 28.2% of women in the North West of England met the NICE recommended level in the first trimester; only slightly lower than the England and Wales average (29.0%).Two of the hospitals had percentages lower than the England and Wales average Liverpool Women's (23.9%) and Warrington Hospital (25.0%). Countess of Chester Hospital (30.0%) had a slightly higher percentage than the England and Wales average. Many women had established better glycaemic control by the third trimester; the percentage of women having established 'good' control rose to 41.0 % in Liverpool Women's and 40.0% in Warrington Hospital. Countess of Chester Hospital (50.0%) had the highest percentage of women who had managed to establish good control by the third semester, but this was still lower than the average for the North West (55.5%) and England and Wales (57.1%). The overall Wales and England figures (2014-2020) (NHS Digital, 2021a) demonstrate the importance of establishing good glycaemic control, especially in late pregnancy, as the number of perinatal deaths increased with a higher HbA1c in late pregnancy and were lowest in pregnancies with late HbA1c <43mmol/mol. NHD digital (2021a) concluded in the NPID 2020 report with regards to the England and Wales figures that 'for both type 1 and type 2 diabetes, the percentage of pregnancies with late pregnancyHbA1c less than 48 mmol/mol has not changed over the past seven years'.

As women with diabetes are at higher risk of adverse outcomes during pregnancy (as mentioned above),the NICE (2015) guideline [NG3] recommends offering immediate contact with a joint diabetes and antenatal clinic to women with diabetes who are pregnant. Table 40 shows how many percent of women in each hospital and the North West region had contact with a specialist antenatal team by 10 weeks of gestation. Countess of Chester Hospital (63.6%) and Warrington Hospital (62.5%) had percentages slightly lower than the regional average (66.1%), whilst Liverpool Women's Hospital had a significantly higher percentage of women who had contact with a specialist team by 10 weeks of gestation.

NICE (2015) recommends that babies of women with diabetes should stay with their mothers unless there is a clinical complication or there are abnormal clinical signs that warrant admission for intensive or special care. Specific criteria for admission to the neonatal unit, including if babies have been born before 34 weeks, or between 34 and 36 weeks if dictated clinically. In their NPID 2020 report NHS Digital (2021a) notes that preterm births, large for gestational age (LGA) and neonatal care admissions were lowest in pregnancies with late HbA1c<43mmol/mol and increased with higherHbA1c in late pregnancy. With regards to England and Wales, 51% of singleton infants born to women with type 1, and 31% of those born to women with type 2 diabetes were admitted to neonatal care in 2020. Again NHS Digital (2021a) notes in the NPID 2020 report that these percentages have not changed over the

last seven years. The median length of stay in neonatal care units was slightly shorter for babies born to women with type 2 diabetes (5 days), than those born to women with type 1 diabetes (6 days). With regards to the regional data (2018-2020), there were large variations in percentages of babies admitted to neonatal units across the hospitals, but all had figures higher than the England and Wales average (45.1%). Warrington hospital had the highest percentage of babies being admitted to the neonatal unit (71.4%), followed by Liverpool Women's Hospital (68.2%); Chester Hospital the lowest percentage of admissions (54.5%).

Table 42: Provider level and regional performance diabetes (all types) key indicators (2018-2020)

Region / Provider	Number of pregnancy records Diabetes		% taking folic acid before pregnancy	% early pregnancy HbA1c <48	% first contact before 10 weeks gestation	% third trimester HbA1c <48	% babies admitted to neonatal unit
	Type 1	Type 2					
Cheshire							
Countess of Chester Hospital	35	25	18.2	30.0	63.6	50.0	54.5
Warrington Hospital	25	15	37.5	25.0	62.5	40.0	71.4
Merseyside							
Liverpool Women's Hospital	115	130	28.0	23.9	74.0	41.0	68.2
North West	*910*	*1,060*	*29.2*	*28.2*	*66.1*	*55.5*	*42.4*
England and Wales	***6,350***	***7,480***	***31.2***	***29.0***	***65.7***	***57.1***	***45.1***

Source: NHS Digital (2021), 'National Pregnancy in Diabetes Audit: Service Level Analysis 2018-20 - England and Wales'.[204]

[204] Find the dataset 'National Pregnancy in Diabetes Audit:Service Level Analysis 2018-20 - England and Wales' here: https://digital.nhs.uk/data-and-information/publications/statistical/national-pregnancy-in-diabetes-audit/2019-and-2020 [accessed: 5 November 2022]. Please note: this table contains figures from the NPDA 'Service Level Analysis 2018-20 - England and Wales' dataset entitled 'data'. The sheet contains data 1) from the services that have submitted data and 2) where 10 or more completed pregnancies (any diabetes type) were recorded in the three year period 2018-20 (services with fewer than 10 completed pregnancies will not have a [separate] report). NHS Digital notes that 'disclosure control has been applied to protect patient confidentiality. Numbers have been rounded to the nearest five, except for 1 and 2, which are shown as "5". Percentages have been calculated after numbers have been rounded'.

7.8. Alcohol: overall population, risks and fetal alcohol syndrome disorder

Alcohol consumption in pregnancy is linked to several, potentially life-changing and life-threatening risks for the infant, including fetal alcohol syndrome disorder (FASD). The term FASD describes a spectrum of structural, behavioural and neurocognitive impairments that are caused by alcohol consumption during pregnancy. It is an umbrella term for different categories of FASD, namely partial fetal alcohol syndrome (pFAS), alcohol-related neurodevelopmental disorder (ARND) and alcohol-related birth defects (ARBD).[205] The NICE (2022c) FASD quality standard [QS204] stipulates that midwives and other healthcare professionals should advise women not to drink alcohol throughout pregnancy (quality statement 1) in order to prevent FASD and reduce the risks of low birth weight, preterm birth and the baby being small for gestational age. The reasoning is that 'as there is no known safe level of alcohol consumption during pregnancy [...] the safest approach is to avoid alcohol altogether to minimise risks to the baby'.

Diagnosing FASD is difficult, as there is not yet a specific test for the condition, although a consensus is beginning to emerge around the optimal diagnostic path (Department of Health and Social Care, 2021). Due to the current challenges with diagnosis, under-reporting by hospitals and issues in data collection, no reliable or detailed data are currently available about FASD prevalence in England (Department of Health and Social Care, 2021). Nevertheless, in a systematic review of data from 187 countries, Lange et al. (2017) found a prevalence of 7.7 per 1,000 children and youth (0-16.4 years) globally, with large regional differences. The United Kingdom was estimated at 32.4 cases per 1,000 population of children 0-16.4 year old (3.24%, 95%CI 2% to 4.9%), higher than the average of the European region of 19.8 per 1,000 in the same age group (which was nevertheless significantly higher than anywhere else). Lange at al. (2017) also found that FASD disproportionately affects children and youth in disadvantaged groups, exacerbating health inequalities.[206] Though a recent study which investigated the number of primary school children affected by FASD, some regional data is available for the Greater Manchester area (McCarthy et al., 2021).The study found FASD in 1.8% (1.0%-3.4%) of the population studied, or 3.6% (2.1%, 6.3%) when possible cases were also included. The authors note that the prevalence estimates, though not necessarily generalisable to other communities, are in line

[205]The classification of these terms, and linked diagnostic markers, have been changing over time, as clinicians and academics are continuing to develop their evidence base. In a recent health needs assessment focusing on FASD, the Department for Health and Social Care (2021) explains that NICE have accepted the Scottish Intercollegiate Guidelines Network (SIGN) 156 guidelines, which simplify terms referring to FASD either 'with or without sentinel facial features'; these guidelines now also apply to England. See Fetal alcohol spectrum disorder: health needs assessment - GOV.UK (www.gov.uk) [accessed: 24 October 2022]. JSNA 2016 listed the following conditions: Foetal Alcohol Syndrome (FAS), Alcohol Related Neurodevelopmental Disorder (ARND), Alcohol Related Birth Defects (ARBD), Foetal Alcohol Effects (FAE) Partial FAS (PFAS) (Lewis et al., 2016, p.41).

[206] It is clear that more detailed data is needed with respect to FASD and how it affects different sectors of the population, so positive action can be taken. The Department for Health and Social Care (2021) concludes in a recent health needs assessment focusing on FASD, that whilst the currently available data can be a useful indicator of the scope of the problem, 'it is clear that policy-makers and providers in the United Kingdom would benefit from access to reliable prevalence estimates to inform their work'.

with the above-mentioned modelled population prevalence estimate by Lange et al. (2017).[207]

Alcohol consumption has also been identified as a causal factor in more than sixty medical conditions for a consumer, including some cancers (such as breast, throat and liver) (NHS Digital, 2020a, p.15). In 2016, the UK Chief Medical Officers (CMOs) published new guidelines on low risk drinking which moved away from daily limits to weekly unit consumption.[208] It is now recommended that men and women should not regularly (defined as most weeks) drink more than 14 units per week, this is considered 'low risk'. Above this level is considered to be 'increased risk'. Drinking recommendations differ for men and women; for men 'increased risk' is over 14 units and up to 50 units, and for women over 14 units and up to 35 units per week. 'Higher risk drinkers' are men who regularly drink more than 50 units a week and women more than 35 units. 'Higher risk drinkers' are considered to be at particular risk of alcohol-related health problems (NHS Digital, 2020a, p.17).

Although we do not have exact current data on the number of alcohol-exposed pregnancies (also see section 7.9, below), data with regards to general drinking habits across the wider population are routinely collected through the Health Survey for England, most recently conducted in 2019.[209] It is important to consider this general data, firstly because they give an indication of the levels of alcohol consumption among women of childbearing age, and secondly, because from a policy perspective, it is important to consider the (higher) levels of alcohol consumption by men because prevention strategies aim to encourage the partners of pregnant women to reduce alcohol consumption (Department of Health and Social Care, 2021).[210]

In terms of overall trends in alcohol consumption, NHS Digital (2020a, p.15) notes that this doubled between the mid-1950s and 1990s in England. Since 2011 the percentage of the participants who responded that they had drunk alcohol in the last year has fluctuated between from 83% (2011) and 81% (2016 and 2017). In 2019, a slight decrease was recorded in comparison with previous years, with80% of participants responding that they had drunk alcohol in the past year.[211] A higher proportion of men than women drank

[207]McCarthy et al(2021) note that 'due to the small sampling frame of schools included and limitations of baseline information obtained on contacted families, we can only conclude this represents local prevalence data in typical mainstream schools rather than being able confidently to infer a "population prevalence" of FASD'.

[208] Find the UK chief medical officers' guidelines alcohol consumption levels here: https://www.gov.uk/government/publications/alcohol-consumption-advice-on-low-risk-drinking [accessed: 25 October 2022].

[209] See https://digital.nhs.uk/data-and-information/publications/statistical/health-survey-for-england/2019 [accessed: 25 October 2022]. NHD Digital (2020a) notes that 'the Health Survey for England, in common with other surveys, collects information from a sample of the population. The sample is designed to represent the whole population as accurately as possible within practical constraints, such as time and cost. Consequently, statistics based on the survey are estimates, rather than precise figures, and are subject to a margin of error, shown as a 95% confidence interval'.

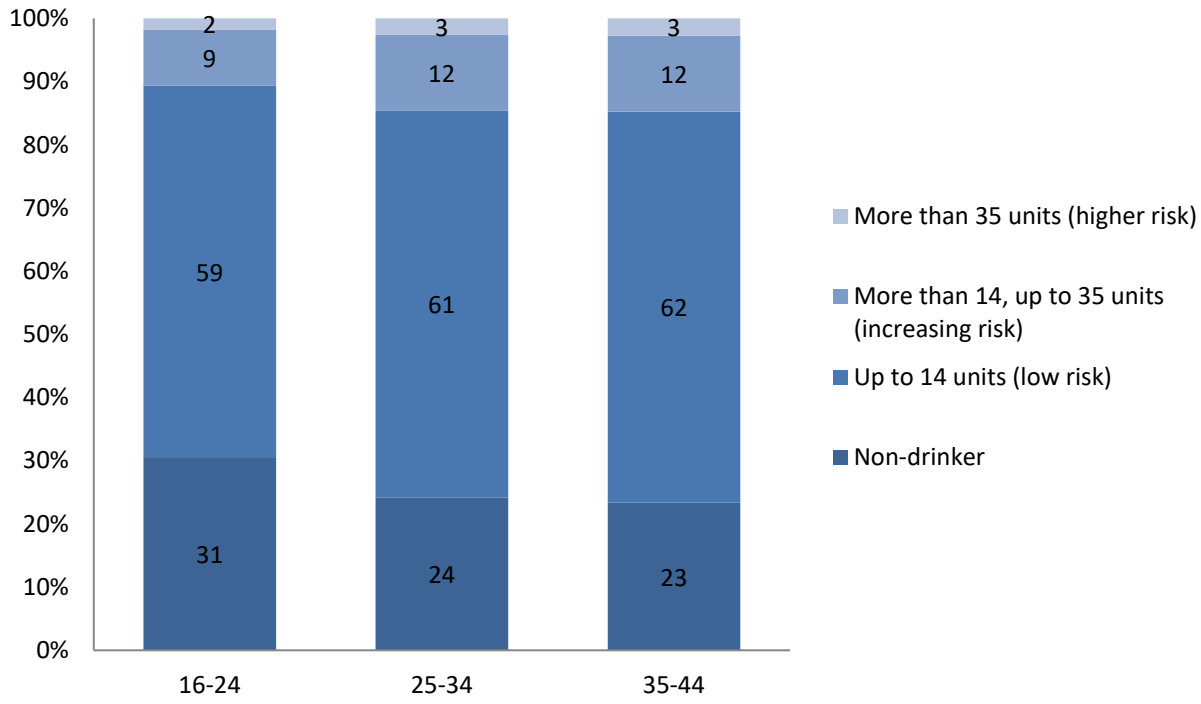
[210] Some data also suggests that alcohol may affect sperm and overall vulnerability to FASD (Department of Health and Social Care, 2021).

[211]Find the dataset 'Health Survey for England, 2019: Adults' health-related behaviours data tables' here: https://digital.nhs.uk/data-and-information/publications/statistical/health-survey-for-england/2019/health-survey-for-england-2019-data-tables [accessed: 25 October 2022].

alcohol in 2019 (83% and 78% respectively), with 55% of men and 41% of women drinking alcohol at least once a week (48% of the total population).In their report on the Health Survey, NHS Digital (2020a) summarises that '57% of adults drank at levels which put them at lower risk of alcohol-related harm, that is, 14 units or less in the last week. 53% of men and 62% of women drank at levels which put them at lower risk of alcohol-related harm'.

Specifically with regards to women, the data show that 23 % of women did not drink alcohol in 2019, or were non-drinkers. Around 62% of women aged 16 and over had a weekly consumption of 14 units or less, and thus within the UK CMOs' low risk drinking guidelines; 12% drank at increased risk level (14 to 35 units), and 3% drank at a higher risk level (over 35 units). As graph 31 demonstrates, figures for women drinking more than 14 units per week varied across age groups. Among women of childbearing age, women aged 16-24 had the lowest percentage (11%) who drank more than an average 14 units and women aged 25-34 and 35-44 had slightly higher percentages (15% each).

Graph 31: Percentage of weekly alcohol consumption, women by age (2019)



Source: NHS Digital (2020), 'Health Survey for England 2019: Adults' health-related behaviours – table 11'.[212]

Alcohol consumption also varied by region in England. Percentages for both men and women in the North West who drink more than 14 units per week were higher than the national average. 27% of all adults living in the North West of England were likely to drink more than 14 units per week compared to a national average of 23%. Among men living in the North West, 36% were likely to drink above the recommended limit, in comparison to

[212]Find the dataset here: https://digital.nhs.uk/data-and-information/publications/statistical/health-survey-for-england/2019/health-survey-for-england-2019-data-tables [accessed: 25 October 2022].

30% nationally. 18% of women living in the North West were likely to drink more than 14 units of alcohol compared to 15% percent in the whole of England.

In terms of household income, the proportion of non-drinkers increased as the household income decreased from 10% of non-drinkers in the highest income quintile to 33% in the lowest income quintile. However, the proportions of men and women who reported drinking over 14 units of alcohol weekly also increased with household income. Among men, the highest proportion of those drinking at this level was in highest income households (44%) compared with 22% in the lowest income households. Similarly, among women, the highest proportion of those drinking alcohol at increased or higher level was in the highest income households (25%) compared with 9% in the lowest income households.[213]

Considering that several of two the local authorities (Liverpool and Knowsley) score very high in terms of levels of economic deprivation, we can assume that drinking levels in those these local authorities and, others which score high in terms of income deprivation, are lower. However, more data on this issue should be collected to ascertain drinking levels amongst women aged 16-44 in the local authority areas in order to formulate public awareness strategies and prevent alcohol exposed pregnancies (see next section).

7.9. Alcohol: Exposure and prevalence of giving up drinking during pregnancy

As noted above, exact current data on the number of alcohol-exposed pregnancies in England are not available. In terms of an international comparison, a study in 2017 placed the UK 4th highest globally with regards to the estimated prevalence of alcohol use during pregnancy for 2012 (41.3% drinking during pregnancy, compared to the worldwide average of 9.8%, and a EU [WHO region] average of 25.2%) (Popova et al., 2017, p.e295).[214] An earlier UK cohort study (2014) suggested a higher proportion (79%, 63% and 49% for trimesters 1, 2 and 3, respectively) (Nykjaer et al., 2014, p.544). However, both studies recognise some issues with the reliability of the data. The Infant Feeding Survey 2010 (McAndrew et al., 2012) provides the most reliable available data for the proportion of women who consume alcohol during pregnancy in the UK, however, this was last conducted in 2010 and since been discontinued.[215] Since then, there has also been a change in guidance on alcohol consumption for pregnant women. MSNA 2016 (Lewis et al., 2016, pp.52-53) presented the findings of this survey. In short, the 2010 survey showed that:

[213]NHS Digitial explains that the HSE uses the measure of 'equivalised household income, which takes into account the number of adults and dependent children in the household as well as overall household income. Households are divided into quintiles (fifths) based on this measure. The age profile of the income quintiles have been age-standardised to account for differences in age profiles between households' (NHS Digital, 2020a, p.22).

[214]The study does recognise significant limitations, however, such as relying on people's memory to record alcohol use (recall bias), and inconsistent data on drinking patterns (Popova et al., 2017, p.e297).

[215]Please find the data sets for the UK Infant Feeding Survey 2010 here: Infant Feeding Survey - UK, 2010 - NHS Digital [accessed: 26 October 2022].

- Amongst responding mothers in the total of the UK, 81% of UK mothers drank before their pregnancy. Two in five mothers (40%) drank alcohol during pregnancy. Mothers in England (41%) and Wales (39%) were more likely to drink during pregnancy than mothers in Scotland and Northern Ireland.

- 49% of mothers in the UK stated that they gave up drinking during pregnancy, 46% drank less and 2% reported that either did not change their drinking behaviour or they drank more.

- The overall consumption of alcohol in terms of units per week was low across the UK (as well as England): 93% of mothers either did not drink at all during pregnancy or drank less than one unit per week on average. 4% of mothers drank 1-2 units and 3% 3-7 units.

Apart from regional variations, the survey recorded data on UK alcohol consumption according to maternal age, occupation and ethnicity:

- In terms of age, 28% of mothers aged under 20 drank during pregnancy compared with 52% of mothers aged 35 and over.

- Mothers from managerial and professional occupations (51%) were most likely to drink during pregnancy, in comparison to 18% of mothers who had never worked.

- Mothers from a 'White' ethnic background (46%) were more likely to drink during pregnancy, compared with mothers from 'Mixed' (34%), 'Black' (23%), 'Chinese or other' (23%) and 'Asian' (6%) backgrounds. Among mothers who drank before pregnancy, 'White' mothers were least likely to give up drinking whilst pregnant (49%) and mothers from an Asian background the most likely (71%).[216]

The survey also recorded data on the level of advice women received with regards to alcohol consumption around and during pregnancy. Midwives were the main source of information with regards to drinking during pregnancy; after birth (mainly with regards to breastfeeding) the main source of information were health visitors (54%) and midwives (45%). Other sources of information mentioned were Surestart centres/ Children's health clinics, the internet and GPs.

[216] As McAndrew et al.(2012) point out in their report on the Infant Feeding Survey, minority ethnic groups, and particularly those from an Asian background, are more likely to be in the 'never worked' category; both groups were less likely to drink before and during pregnancy.

8. Interviews with women who have used maternity services during COVID times

8.1. Summary

We conducted a series of focus groups and in-depth semi-structured interviews with women from different minority backgrounds to inform this study.[217]To cover the report's focus on the impact of the COVID-19 pandemic, all participants gave birth between March 2020 and August 2021. As the MSNA 2016 (Lewis et al., 2016, p.63) had highlighted that the need to capture more experiences of the women's partners with the maternity system, we also spoke to men who became fathers between March 2020 and August 2021 in unstructured interviews. The study was approved by Liverpool John Moores University ethics committee.

To recruit participants we approached a Children's Centres, local mothers' groups on social media, and identified participants via the Community Engagement Leads of Women's Health and Maternity (WHaM) (Cheshire & Merseyside Health and Care Partnership Programme) who acted as gatekeepers. Recruitment was difficult; firstly, the study did not offer any additional incentive for participation, which is very likely to have impacted on the number of people who put themselves forward. Secondly, it is likely that parents whose experiences during COVID times had been negative would not to want to recall these 'difficult' times. Nevertheless, with the assistance of our gatekeepers, we recruited eight women from different minority backgrounds. All of the women we spoke to had migrated to England from other countries (Somalia, Yemen, Sudan, Syria, Latvia and France) and some were refugees. None of the women had English as their native language. We interviewed four women face-to-face in a focus group, two women in a focus groups via MS Teams, and conducted two interviews with women separately, also via MS Teams. The face-to-face focus group was conducted with the help of a translator for Arabic. The interviews were voice recorded and then transcribed. We also conducted informal interviews face-to-face with four fathers.

The women had between one and seven children. All women had given birth in hospital during between March 2020 and August 2021. Two women gave birth via an elective caesarean, two had emergency caesareans and four via spontaneous vaginal births. For reasons of preserving their anonymity, the women asked us not to mention the hospitals they gave birth in.

Although the women were happy for us to acknowledge which country they came from, we have not systematically referred back to their respective countries when discussing the data. We took this decision after a discussion which ensued during the face-to-face focus group. When asked whether the women would object that we included the countries they came from in the report, one woman responded that she was unsure about this. She explained that if we included their countries of origin, people would think that their experiences were unique to women from a migration background. She explained that

[217] We identified the following groups for participant recruitment: women from the general public who identify to be from an ethnic minority background, have learning disabilities, are from a background of economic deprivation, are first generation immigrants from Eastern Europe, or are refugees or asylum seekers.

through her experiences with online mothers' group discussion forums she was aware that women from a British background (including 'White' women) had similar experiences (including 'bad' experiences) with the maternity services. She felt that no differentiation should be made between communities when it came to how the women's experiences were discussed. The other women in the focus group agreed. We explained, in turn, that this report sought to highlight that we had included a variety of perspectives from residents in the area and therefore we felt that talking about their backgrounds was important. At the end of the discussion the women agreed that we could mention the countries that they came from.

As the data covered in this JSNA show, women from ethnic minority backgrounds have comparatively worse outcomes during pregnancy and birth across a variety of indicators. It is still a reality that women from different ethnic minority backgrounds experience issues due to racism, language difficulties or lack of cultural awareness which might negatively affect their experiences and pregnancy outcomes(e.g. see Birthrights, 2022; Peter and Wheeler, 2022). As is discussed below, one woman clearly felt that non-native English language skills and foreign accent had negatively impacted on aspects of her care. Nevertheless, we recognise that an individuals' experience during pregnancy, birth and in the antenatal period can be impacted by any number of personal character traits, previous experiences, modes of identification or ethnic background (or how these are perceived by others). In line with our participant's concerns, we will only highlight where these experiences (including a participant's ethnicity and language skills) are likely to have influenced their experience. The women's experiences should otherwise be understood as those of women who live in one of the local authority areas which this report focuses on, rather than those of a woman from a particular ethnic background, skin colour or country; in line with our participant's views we seek to highlight 'similarities rather than differences'.

8.2. Pre-pregnancy

In line with the findings by Lewis et al. (2016, p.53) in their research for the MSNA 2016, most of the women we spoke to had not accessed health services for advice before becoming pregnant, but mentioned receiving information from friends and family members, or accessing different internet sources instead. Two of the women were actively preparing for their pregnancies and had relied on various internet sources for information. One of the women explained:

> Yeah, [my] pregnancy was being delayed. So [I] got most of the information from leaflets, from YouTube and [about] all the lifestyle, like reducing the weight and everything until [I] got pregnant [interview: M, 31 October 2022].

8.3. Care in pregnancy

Lifestyle advice

All women said that they received general lifestyle advice (including exercising, which foods to avoid etc.) from their midwives. Some mentioned that they had approached their

midwives to get more information on how the COVID pandemic would impact on their giving birth. All were happy with the information they received. Many women also got information from the internet, as noted above, some already before they got pregnant:

> And I looked for information myself. Even before being pregnant. And so, yes, I was looking for information. Then I went on the [hospital name omitted due to request of participants] Hospital website. I went on the NHS website, [...] I got information like this. And then after when I saw the midwife, she, like, repeat the information, the main information (interview: M, 31 October 2022).

A few of the women highlighted that they particularly liked 'Mumsnet' (https://www.mumsnet.com/) and had accessed information there.

Several of the women we interviewed already had one or more children before becoming pregnant with their baby born during COVID times and were already aware of the general advice. As the same woman explained: ' [...] I got advice on how to get ready, how to take care of the baby, how to take care of your pregnancy. So I get [an] idea from my first pregnancy and then I got more advice on how to take care of my baby, yeah'(focus group: N, 26 July 2022).

Routine appointments

In line with the findings of Lewis et al. (2016, p.53) in their research for the MSNA 2016, the majority of women interviewed were happy with the care they received during their midwife appointments. However, the Covid measures affected the form and frequency of routine appointments. Appointments were held on the phone or via video call online, or women had a mix of face-to-face and online appointments. Most women were fine with this arrangement, feeling that there was no real difference in the level of care that they received between COVID and 'normal' times. Women who had no complications during pregnancy felt that if they more support would have been available had they needed it:

> Because normally they would see you when you are 36 weeks and 38 weeks, but at that time, and it was COVID then in 2020 yes. [...] I see her [the midwife] two times face-to-face and the rest of them through the camera. But I think that was because that was my baby number four, and there wasn't really any concern about, you know, my pregnancy. They say everything is going smooth. Maybe if I would need some extra help they would see you more often. I think yeah. In my case that was straight forward (interview: E, 28 September 2022).

Women who needed additional care during pregnancy involving additional blood tests, monitoring or scans noted that such appointments went ahead as 'in normal times'. One mum who gave birth via a planned Caesarean thought her care was good:

> ... especially in this period. Because that was lockdown, you know? You got all the information which is like normal times, yeah? Scan, blood pressure, the doctor discussed with [me] how [I'm] going to have the baby, because [...] the previous baby was a caesarean. He talked to [me] about that [...] about the operation. The operation was [with] great people during that time (focus group: N, 26 July 2022, translated).

One woman who had issues with strong pain and additional risk factors which could have led to her baby being born small, large, or early, mentioned that her midwife came to visit her frequently at home. She felt well cared for and happy with the care she received.

Most women mentioned, however, that they thought they had not received the recommended number of appointments. Some women explained that this was because they struggled to actually obtain appointments, in some cases due to staffing changes. One participant explained that for about four months she did not hear from the hospital or her midwife:

> From July until November. I phoned the whole time and [they said that they] sent me two texts... and a voice message, but I didn't get any voice message and I received the phone [call] from the doctor in August, and he informed me the date of the C-section and he sent me all the information by the.... postal service, yeah. From August until November I didn't hear anything (focus group: N, 26 July 2022).

The mother wondered whether her situation had been down to 'Corona', but it turned out that the midwife who had looked after her initially had left. She wondered why her care had not been taken over by another midwife:

> ... but when I [finally] went to the hospital, I saw all of the women, they came to do like, uh, the regular check with the midwife. And I thought... I didn't understand why I didn't hear anything from them. My name is... of course my name is on the computer (focus group: N, 26 July 2022).

When she enquired about the situation, she was told that she was partly to blame for the situation:

> I asked [the midwife]: 'who's at fault'? And [she] said: 'It's both of you, you and the midwife. You should call and ask, and the midwife should inform us if she is working in [an] other place or something like that'. Yeah. Ok, but after that I had a good care from the second midwife. She sent me an appointment, she visit me one time in my home, because it was just four months [and then], because I delivered my baby at the end of November (focus group: N, 26 July 2022).

As noted, some women struggled to obtain appointments with midwives. In one case, appointments were arranged, but the midwife did not attend at the agreed time and did not respond to requests from the mother to contact her. In another case, the problems in getting appointments resulted in her seeing 'the midwives only twice':

> My first midwife told me that she's gonna have her leave, so she said: 'try this number'. I rang the number, no reply, nothing. So I just, I was worried because I want to ask some question about COVID, lockdown, will I have the baby alone? But I couldn't get answer[s] that time. Because you have to follow the guidance. ... you have to wait for the doctor, therefore [I] checked what was going on [via] their website to have more information [...] and after that, I see the second midwife. And she called me, it was late pregnancy, about seven months and she said [call the GP]. So I went to the GP and they also said 'we don't have appointment' and the one they offered me was after my due date... I told them: 'it's after my due date'. And they said, 'well, we don't have any appointment'. And that was that until I had to give birth (focus group: D, 26 July 2022).

However, a reduced number of routine appointments were not an issue for all. One mum who had face-to-face appointments at a children's' centre and who did not have the number recommended for first time mums explained:

> I was happy. I knew I didn't have like all the appointments like in normal times. Umm, but I didn't mind because I believe if there was a problem, I would have had more appointments, you know, I would have met them more. But you know, if they tell me that I can come only every, every month or every like, 6-8 weeks it means everything's fine. So I wasn't worried about that. And they were good (interview: M, 31 October 2022).

Partners and routine appointments

When asked whether the women's partners attended midwife appointments or scans, the women gave mixed answers. Some women said that while their husband came along to appointments and scans for previous pregnancies, or the early appointments and scans of their pregnancy during COVID times, they were later not able to due to COVID- protocols. Several women mentioned that their husbands had to work and so could not attend. One woman explained that her husband had no interest in coming along to the appointments and did not see this as part of his 'role'; on top had been opening up a new business, which had meant he was 'very busy'. She thought however, that involving her husband more would have been a good idea:

> So they know what women go through and, ah, now little things which woman need to do with, like, with the baby. So they don't think: 'so that she got the baby and she don't do nothing', they sometimes think I think so. I think that would be very helpful I think to a lot of families (interview: E, 28 September 2022).

Antenatal classes, parents' groups and opportunities to exercise

In order to gain an insight into the way the COVID-19 pandemic may have affected the women's ability to socialise and exercise, we also asked the women whether they attended any antenatal courses, groups, classes or exercise in person or online. The women gave very mixed answers. Face-to-face social or sports groups were not allowed to take place during much of the stringent lockdown phases. As one woman described, the gyms were closed and she had little motivation to exercise at home:

> I was [initially] motivated, I'd say. I thought when I would be on maternity leave I will really start doing some sport, but I've been on early maternity leave because of the COVID. I had to stop working before, so I had time to do it, but the gym was closed, everything was closed and after, I wasn't motivated. And when I was five months [pregnant], I had too much backache, I couldn't move. And then I started doing some sport and after [that] everything was fine. [...] Like I told [you] online is difficult and going to gym during COVID wasn't possible and [now] with the toddler it's difficult (interview: M, 31 October 2022).

Some women stated that they did not manage to exercise because they were too busy (one women noted that she studied at college), or just did not get round to it. One woman explained that the COVID pandemic had made her life stressful, as she had to look after her

other six children, including their home-schooling. Additionally, the pandemic situation made her anxious:

> I wasn't doing anything, because I was too scared, to go out! I used to tell my husband: 'have you washed your hands, you came from the shopping now, no?' I was busy doing that, you know, getting the kids, washing their hands. [...] just following the news, what's happening in China, it was a very bad time. [...] Yeah it was lockdown, teaching the kids... it was a busy time (focus group: M, 26 July 2022).

One participant said she did not attend any classes or exercise, but she acknowledged that exercise like yoga might have helped her with the pain in her back which she felt during pregnancy. She also thought that more social interaction with other might have helped with the anxiety she felt with regards to the pain:

> ...when I was pregnant I was confused [...] nervous because all time I have the pain. [...] Maybe if somebody said to me: 'go to yoga or sit with [other women who are pregnant]' maybe [that would have] reduced my pain, you know? (focus group: Z, 29 September 2022).

Some women did manage to exercise, stating that they accessed exercise classes through the internet, or applied what they had learned in previous classes at home. One woman explained that exercise had been already part of her routine before pregnancy, and that the pandemic did not alter her routine significantly.

We asked the participants whether a lack of socialising with friends and family due to the COVID restrictions impacted on them in any way. Several women noted that they had missed their friends, but were kept very busy by looking after their children and managing the home life. One participant had moved to the area she lived in only recently before the COVID pandemic began. She said that she missed socialising with others and would have liked to access support groups: 'I was at home without, after a caesarean without friends so, so yeah, I did miss it and actually a lot (interview: E, 28 September 2022).

8.4. Labour and birth

In line with findings of MSNA 2016 (2016, p.56) in general mums praised the care that they had received during labour and birth. However, as will be discussed below, some mums were very unhappy with the care they received during labour and with their experience in hospital. There were some instances of a lack of communication between caregivers and one instance where a disregard of women's own judgement with regards to how advanced her labour was seriously impacted on her birth trajectory. As we will discuss below, two women were denied the desired pain relief.

Covid-19 measures

Notable changes to hospital protocol under the COVID-19 measures included that 1) women and their partners had to be tested for COVID-19 before going to hospital or upon arrival, 2) birth partners were not allowed to join the women until labour was advanced, 3) mask wearing and 4) visitors to mother and baby were not allowed in hospital after birth. Most of

the women did not mention that they found the measures causing them stress, or particular problems or upset:

> Yeah. Then we had COVID tests both of the times... and my husband was not allowed [to join me] until I was 7 centimetres open. But [as] I was already was 7 centimetres open [when I went to hospital], so my husband was able to be there for me. And yeah, nothing, they didn't say nothing [with regards to any other specific COVID-19 protocols], just that they say that nobody [is] allowed to come to see the baby when you have it. It's just when you go home and that's it. Mask? No, I think we didn't have the masks. Yeah, we didn't have the masks. No (interview: E, 28 September 2022).

In some cases, the rules seemed to have been slightly relaxed, in the line with the needs of participants. One participant explained that her husband had been allowed to be with her throughout her labour: 'No, my husband .... They didn't say your husband can't stay with you. And just they did the test for corona virus and with me and my husband, and they say: 'ok, you can stay' (focus group: Z, 29 September 2022). Another woman also explained that at her request her husband was allowed to come in earlier than she had thought had been allowed: 'actually I asked and they said: 'yeah, no problem'. And I said '[is it] ok if I'm not 5 centimetres?' and it's ok, they let him come' (interview: M, 31 October 2022).

Two participants explained that the masks hindered their breathing and that they therefore did not wear it. As one mum described:

> ... and we have to have a mask. And I said: 'I can't have mask, I can't breathe!' You have problem breathing, and they just say: 'have a mask!'. I just took the mask, but I didn't put it on. That's... and then they did the COVID test. [...] Yeah it's good to have a mask, but when you are at this stage and you are told to have a mask, you don't even [know what's happening to you] (focus group: M, 26 July 2022).

A participant who had been booked in for a caesarean section explained how the COVID protocol was followed in her case and highlighted that the midwives had been very accommodating:

> Because [I] had some kids at home, they offered [me that] somebody come [to my] home to do the test for Corona. They did [that for me]. They ask [me] when [I] went on the day of the operation – [I] went by [my]self – [my] husband was waiting outside. They told [me] that when you are ready, when you are going to theatre, call your husband. So, [my] husband waited outside, they didn't ask him to have the Corona test [before]. So, [only I] had the test. But when [I] was ready to go to theatre, [...] they call [my] husband to have the test for the operation, to see the baby (focus group: N, 26 July 2022, translated).

Positive and negative experiences

In line with findings of MSNA 2016 (2016, p.56) in general the mums praised the care that they had received. Both of our participants who had planned caesareans were happy with their care. As one mum described:

> The day of [my] operation, because [I] had caesarean,[I] didn't feel any different, it was normal. The only difference is with the first baby [my] husband was with [me] all the time. This time he wasn't with [me]. And everything was ok. [...] during the operation, [I] had very strange feeling and [I] had a pain, but they gave [me] like a painkiller and [I got] better(focus group: R, 26 July 2022, translated).

A first-time mother, who ended up giving birth via an emergency caesarean at the end of a long labour, also praised her care: 'Uh in the [...] hospital [it] was so, so good. I had two very good midwives' (interview: M, 31 October 2022).Another mum described how particularly well she felt looked after, as the same midwives returned to look after her, and she was offered use of a birthing pool and massages for pain relief. A midwifery student she had known from her pregnancy stayed with her throughout her labour, which she appreciated.

However, three participants told us about negative experiences during their time in hospital. In the case of two mothers, issues with [mis]communication and organisational negatively affected their births. The first mother had gone to hospital on the day on which she had been booked in to be induced as she was overdue. But due to a lack of beds and the hospital being very busy, she was sent home again. This made her anxious as she was overdue. The mother's contractions started in the night and she went back to hospital, where her waters were broken. After this, the baby turned breech and due to the baby's breech position it was born via emergency caesarean. As this was not the mother's chosen method for giving birth and she had had previous vaginal births, she has understandably negative feelings and memories of her experience, which are compounded by the fact that there seemed to have been general organisational issues and issues with communication when she first went to hospital:

> But yeah, that's how it happened. I wasn't very pleased because that was very messed [up] like. It was like one doctor says this and another doctor said this, like different things, you know, like once I wait, once I go. I was [waiting a] very long time, I didn't have the room where to go as well. I was just you know like, in the waiting room waiting for a room. [...]. They, they didn't make [it clear to me] as well when all this happened. ... That was [a] horrible experience because it was caesarean, I didn't really enjoy it. I didn't like it.
>
> So it was just very busy, and maybe nobody take the responsibility. That was like ohh this doctor told me this, this midwife tells me this, like it wasn't one person. I didn't want to complain or blame somebody. But [...] one [person] said this and other people say another thing (interview: E, 28 September 2022).

When asked whether she thought that the COVID-19 pandemic might have contributed to the organisational issues, she replied that she did not think so, but that the hospital just seemed to be very busy at the time. The bad feelings about her experience were further compounded by the fact that after her waters were broken, the doctors did not communicate what was happening to her. She explained that they 'just came to put something in [her] arm' and informed her that they now needed to perform an emergency caesarean:

> And so if they tell me straight away what is going on every step, I would feel more comfortable. Maybe [it was] because they didn't know exactly what [had happened]? But I didn't know 100% until another doctor came and make the scan, because they didn't understand what is this baby's leg or arm. They didn't know which position it is [in]. Maybe that's why. Maybe that's how they do [it]. But when all this happened, I didn't feel comfortable (interview: E, 28 September 2022).

Another woman explained that she had been given two sets of different information with regards to whether she should attend the hospital or midwifery unit on the day she went into labour. Her midwife had told her to go to the hospital. When she rang the hospital, she was told to go to the midwifery unit. This is where she then went. However, during labour she felt like she needed additional pain relief:

> And I asked for proper pain relief, not gas and air, gas and air is not enough for me. And they said: 'you cannot on this ward, because this is midwife-led'. I said: 'transfer me to that one'. They said: 'no we can't'. So I was stuck there, just praying for my pregnancy to proceed quickly, because I didn't want to return home in this state. It took... after two hours, like one more centimetre. The labour took eleven hours; normally I wasn't like that long(interview: D, 28 September 2022).

So in the case of these two women, it is quite clear that wider organisational issues impacted in their experiences, which then in turn affected the choices they could make with respect to their births. In the case of the second woman it is evident, that she had not been able to make an informed choice with regards to where she wanted to give birth, nor did she seem to have been informed properly about the options available to her.

One mum of three, who had also reported having mixed experiences with her midwives, told us that she faced multiple issues during the births of her children and she was evidently very upset about her experiences. During the birth of her first child, she was refused pain relief:

> ...like when you are on the labour you are in pain, yeah, they tell you: 'push, push', and then you have back pain and then they have to give you, you know, the injection. [...] They refuse to give [me the] injection. Ohh. I ask her [her midwife]: 'why? I'm in pain, I have pain. Why you don't give me the injection?' She said: 'because the guy, he's not... he's busy. I said 'why he's busy?[A] hospital has to [have] like 2-3 staff at least to bring me the injection'. She say: ' ohh sorry, sorry we can't do nothing'. [I said:] ''You have to bring me, to make me injection in my back [it] pain[s] me too much, like painkiller does not solve it'. So they refuse like this, you know? (focus group: H, 29 September 2022).

With her second child (born in July 2020 during lockdown) the level of her pain during labour was not taken seriously, or misjudged, by staff at the hospital. The mum had gone to hospital with contractions that came every five minutes and after seeing blood in her underwear. However, when she arrived at the hospital, a midwife told her, without a previous examination, that her labour was not advanced enough and that she should return home.

> You know, I feel I have labour [...] and then when I go there [to hospital], then they say: 'why you come here?' And then I say: 'it's because I have pain. Labour's come, I feel it'. And then they say, without seeing me, without checking me, and then they say: 'if she's not open, you know, 6 [cm], I send you home. Looks like you don't have to come like this', you know what I mean?
>
> How would I know [how far] it's open? But I know I have blood and then I have, you know, every five every 5 minutes pains, already I'm in labour. So how would I know it's open... this is your job, you have to do it! And then they say: 'you have to go' and then I refuse to go. I refused to go, [this was my] second baby and then I refuse to go home. And then they also say: 'ok, otherwise go [for a] walk and then come back'.
>
> But still I say: 'no, ok [...] I go to downstairs and in the in the in the [name deleted] hospital downstairs. And then after two minutes I just came back and then when she checked me, already I am in labour like 6 inch open. And then after I came in the, you know, she bring me [to the] rooms, everything, like [after] five to ten minutes, I have my daughter.
>
> So the yeah [...].... I'm so lucky, you know! If she refused to tell me to stay in the hospital, maybe [I would have had] my baby in the street, you know what I mean [...]. So [...] she has to see me first to say what happened with me, not to say when she see me 'ohh if not open by [six cm] I send you home'. And then they make, like they treat us like, you know, looks like someone I don't want to work [with], but she have to do it like this [check how far the cervix is dilated].

During this birth she also felt uncomfortable as she was looked after by a midwifery student, who was not always supervised by a senior. She worried that this might have put her and her baby's health at risk:

> [...] sometimes, they don't bring you midwife and proper midwife. They bring you [a] trainer midwife. Traine[e] midwife, one person, you know? Me? One trainer, how come? Why [do] you give me [a]trainer? Why don't give me proper midwife? [...] This is not like toys [...]. [This is a real-life situation, it about] life, children, kids, everything, life! Even if she give me [a] trainee, doesn't matter, but with another midwife, you know who is qualified (focus group: H, 29 September 2022).

Again with another of her other pregnancies she received mixed messages from different healthcare professionals. When she experienced mild contractions and a bleed towards the end of her pregnancy, she called the hospital. The doctors there asked her to stay at home and wait 6-8 hours to see what would happen. But when she called her midwife, her midwife told her to go into hospital 'no matter what', as she was booked in for a check-up appointment anyway. The woman wondered why the doctors at the hospital did not see this information on the computer system and had told her to stay at home: 'my midwife said [go to hospital], but [name deleted] hospital told me stay in the home, see? [...] We are confused here' (focus group: H, 29 September 2022). A midwife broke her waters during her appointment and she stayed in hospital to have her baby.

When we asked this woman whether she thought that different midwives had treated her differently, this mum replied:

> Depends on their mood, you know, sometimes ... with some people, you know [...] the way I speak, they think I'm not from here, maybe so... you know? So sometimes they do that, I think so. Because I don't have [a mouth] to speak, everything to say, maybe that. I'm not too sure. I don't, I don't know why, but exactly... I don't know why (focus group: H, 29 September 2022).

This woman's multiple negative experiences, which included that her labour pains were not being taken seriously, that her previous experiences with childbirth were disregarded, that she was effectively denied pain relief, and that she repeatedly received mixed messages from caregivers, not surprisingly led her to speculate whether her treatment might be linked to the fact she had a migration background and that English was not her first language. Her experiences are certainly in line with testimonies described in recent reports by Birthrights(2022) and Peter and Wheeler (2022), which show that non-White people have a higher incidence of reporting issues with the downplaying of their labour pains and denial of pain relief.

8.5. Support immediately after the birth

Most women's experiences after they had given birth but were still in hospital were positive. As one woman noted: 'yeah, she [the midwife who looked after her] was very good, she was good. She looked after me very nicely and she said 'if you need anything just tell me' (focus group: Z, 29 September 2022). However, there were some issues around breastfeeding support and care for mothers who had had caesarean sections.

Breastfeeding

Most women explained that they chose to breastfeed their babies and felt that they received good support with establishing breastfeeding. A first-time mother exclaimed that she initially struggled to feed her child and was offered additional formula milk to feed her baby:

> Yeah, I was breastfeeding when I was there, but breastfeeding was very difficult. It was working but it wasn't enough for her. [...] So they will tell me, they will tell me to give her some milk, which I didn't really want, but I [agreed] to give her some extra milk. [...]We did it twice when she was really, really hungry. So they give us some extra milk and.... But yeah, everything was good (interview: M, 31 October 2022).

After a month, her feeding was well established and she was still breast-feeding her daughter at the time of the interview.

Another first-time mother who had her first baby during lockdown explained how she struggled to establish breastfeeding and felt that she should have received better support with this:

> After the birth, [I] went to the ward.[...] the baby started to cry for six continual hours. And [I] asked for [milk], because at the beginning [I] can't give him, [I] can't feed him. Nobody's coming to help [me] until [I] asked. [...] after six hours, [I] asked for a bottle for the baby and [...] after one hour they brought the bottle. As soon as the baby has the bottle, he sleeps. And [...] if from

> the beginning they brought something for him, it would [have been] be ok. [...] that was the only problem, that they didn't give [me] the bottle.
>
> [...] [I] didn't know, because [I] wanted to feed him, but [I] didn't know that, yeah, if [I] feed him from the first time the baby can get something. [...] the second day, somebody explained to [me] that if you give the baby your breast, when he'll suck he'll get something and this is good for him. [...] [But] because that was [my] first baby [I] didn't know that [...]. If they [had] explained that [to me] from the first day, [I] would be ok, yeah (focus group: M, 26 July 2022, translated).

Again, this mother managed to establish her breastfeeding in the end and was still continuing to do so at the time of the interview.

A mother of five told us that after her emergency caesarean she neither felt well supported in her choice to breastfeed her baby, nor in her choices of how she wanted to care for her baby:

> And uh, [after the caesarean] that wasn't very good. [...] probably I was stressing myself out as well. And the lady said you can't - because they give you some sleeping pills to relax - and they say you can't keep your baby in your hands. And I was constantly breastfeed her, because I breastfed all my kids and she was like: 'your baby is crying give her [a] bottle and I was like: 'this is my fifth baby. I'm not going to give her [a] bottle no matter what; because I know that she gonna get this milk more than likely, but it just takes time [...].
>
> [...] Now I told her, because I didn't feel sleepy and I refused to take these sleeping pills, I say: 'painkillers, yeah but not like that sleeping pills'. And I say 'I wanna hold my baby, like all the time because this is how I do [the] first night, I'm gonna hold her and I'm gonna feed her [...]. [Even] if it's difficult, I couldn't put her myself in the little bed, and they say: 'oh, this is not safe and like that'. But I say: 'this is my baby and this is how I do with all of them. And I'm gonna do with this one as well!'
>
> And she said I'm gonna help you to stand up, and then she didn't. And then I tried to stand up myself because I felt all dirty ,and it felt like she's not coming [...] and then I stand up myself and she said: 'why did you stand up? I told you not to do it!' (interview: E, 28 September 2022).

She described her time in the hospital as 'horrible', but explained that during the next shift midwives took over who she found 'very kind, very helpful and very understanding' and supported her in her choices. Again, a lack of support of women with regards to their choices was the key issue during the care of these mothers.

Other issues raised

The women raised several other issues with regards to their care after they had given birth. Firstly, while the majority of women said that midwives had explained to them how to care for their wounds after the caesarean section, one woman explained that she had not received sufficient information and struggled with the wound, which then took six month to heal. Secondly, several women noted that they felt uncomfortable when going back to the general shared ward. The women noted that the wards were very noisy, making it hard for

them to recover or sleep. Thirdly, the women in the focus group (26 July 2022) all agreed that they struggled to move around in the hospital after giving birth. In particular the women who had stitches after birth or given birth via caesarean section wanted us to pass on that they struggled and that women should have access to wheelchairs. As one woman described: 'No I wasn't given any wheelchair. I'd prefer the wheelchair. ... I walked with my blood flowing' (focus group: D, 26 July 2022). Another mother added:

> No wheel-chair for [me]. So [I] ha[ve] to walk, which was very hard with the operation and [i] didn't feel well to work all this distance. So what [I'm] asking, yeah, at least to give the ladies a wheelchair, take them in a wheelchair from the ward to the car (focus group: N, 26 July 2022, translated)

Lastly, one woman noted that she wished that there was more choice with regards to how long women could stay in hospital. She explained that she had been asked to leave when she felt that she was not ready:

> And I said: 'no I want to stay for the night'. They said 'ok, but this is only [because of] COVID, so you can't stay'. Only because of COVID, they want people to leave. But for my previous pregnancies, I had the same, similar experiences, like, they want... I feel like they want to get rid of you. [...]
>
> Yes. I have... lost lots of blood; I needed to check whether my blood count was back to normal, so they have to let me know that I can stay. So that, that's the problem. They won't allow you to stay and aren't kind. I'm not saying everybody's like that, [there are] very good people get working [there], but also people who have to learn how to be nice to people and kind. Because at the same time as the one who wanted to get rid of me, another one was listening and she said, you can ask if you can see, for the manager, because that lady wanted to make me go. She said 'there's not enough room. There are lots of people waiting'. But afterwards when I stayed, the ward was empty, only me and another girl. So I feel like I was... pushed! (focus group: D, 26 July 2022).

Again, as these testimonies highlight, women felt there was a lack of choice and a lack of support for the choices that they made in terms of how they wanted to look after their own and their babies' needs.

8.6. Support after discharge from hospital

Information and signposting

Most women were very happy with their care after they left hospital. All noted that they received visits from a midwife when they returned home who checked them and their baby. All women had received signposting to services from their midwives and/ or health visitors with regards to where they could access support with mental health, breastfeeding, domestic violence help lines, child developmental milestones, healthy start vouchers, and later after birth, weaning. The mothers received information through various formats, mentioning leaflets, phone calls and text messages. One mother noted that she received leaflets and phone numbers from her GP. Several mums mentioned that they received

information from a breastfeeding support and information groups such as Bambis, and several mothers also mentioned that they found the information they needed online. As one mother described:

> The ones with the purple, I forgot their name, for the breastfeeding [support group]. Yes, I rang them, they text me. I think the hospital did that to be fair, or something, I don't know. They send me texts just to tell me about, you know, babies, how often you feed and more information. Yes, they used to give me... tell me about, when there is growth spurts... they will text me' at this time your baby will have [*growth spurts*]'. Yes, that's what I received (focus group: D, 26 July 2022).

Aftercare

Three of the women mentioned issues during their aftercare. Two women struggled with the healing of their wound after a caesarean section: One mother had told her midwife at a postnatal visit that she thought that her wound was infected. The midwife advised her to take a course of antibiotics, which did not help her. After a while, the midwife told her to contact the GP who then advised her it was safe to carry on using the antibiotics. As more time passed and the wound still had not healed she was referred to a hospital:

> When [I] went there, [...] the doctor seen the wound, [and] the doctor was shocked. ... the doctor was shocked and said: 'where you have been?' [...] and they did a scan for [me] and they said to [me]: 'we will send the results to your GP'. [But] they didn't contact me, when I contact my GP they said: 'all the result came back and everything was normal' (focus group: R, 26 July 2022, translated).

She explained the wound, however, had still not fully healed at the time we did this interview and she was visibly very shaken and upset by her experience.

The second mother who struggled with the wound from her caesarean section described that she sent photos of her wound to the GP; the GP told her that she did not need to be seen, as the wound looked as if it was healing normally. However in the end it took six months for the wound to fully heal. This mother described that she would have liked to 'tighten' the belly, by wrapping something supportive around it as it felt better that way, but was advised not to. When she asked why this was the case she was told: 'we can't tell you that because we don't recommend that one. So maybe it's just again like rules and regulations. But I was little bit ...disagree' (interview: E, 28 September 2022).

Lastly, another mother described that she felt very strong pain after giving birth and had to attend A&E. Due to COVID protocol she faced a dilemma: she wanted to exclusively breastfeed and would have been allowed to bring her newborn, but she could not carry the baby due to the pain:

> [There are issues with] the aftercare as well, you know, when, for example, when I had to wait for two long hours in the pain, you know, when I had problems later on, when I came back in emergency. If they would allow a breastfeeding mum... because they said: 'you can bring your baby, but no one with you'. But with the pain I had, I cannot bring my baby. I wanted to fully breastfeed but because of that, my husband has to bottle feed while I was gone. If they allowed

someone to be with you, you know, you can breastfeed and give the baby to your partner. But they wouldn't. They allowed when I was having the baby, but after when I had the emergency thing going on, my husband wasn't allowed to come, they said: 'only your baby' (focus group: D, 26 July 2022, translated).

Choice and support of women's choices were again key issues here; another issue was that some women's symptoms were not taken seriously, although they caused them discomfort and pain. This then had long-term impact on the mother's mental and physical wellbeing.

8.7. Fathers

Lewis et al. (2016, pp.62-63) found in the MSNA 2016 that women generally felt that their partners (if they had one) had been well supported during their pregnancies. Many partners had the opportunity to attend antenatal classes, although missing out on antenatal appointments (generally because they were working). The report also found that hose fathers who came along to see the midwife had been able to build up a relationship with the midwife. In contrast, while most participants we interviewed for this report felt well supported by their partners (with the exception mentioned above), none of the women attended antenatal classes. This was most likely due to a combination of reasons which included that they already had previous children and/or a lack of time, and the fact that such classes were cancelled during the Covid-19 lockdowns. As noted, some fathers nevertheless were able to attend some of the earlier antenatal appointments.

Further, Lewis et al. (2016, pp.62-63) found that the majority of mums said that their partners were with them during the birth. Despite the Covid measures, this was also the case for most of the women we interviewed. However, again paralleling findings of the JSNA 2016 (Lewis et al., 2016, p.63), one participant in our research gave birth without a birthing partner, as he was looking after older children

Father's views

We also sought views from fathers with regards to how they felt about their partners' pregnancies and birth during the pandemic. A common theme was that they found the overall situation 'scary' and 'stressful'. One father explained that he was working in retail at the time and was scared to bring the virus home to his pregnant wife. Overall experiences with the maternity services ranged from 'very good' and 'good' to 'at times very frustrating'.

One man with three children whose partner had a home birth during lockdown, described that this had been a 'good experience'. The father said that his partner had no issues with accessing the services and seeing the midwives and health visitors, concluding that 'it was all good'. He noted that the home birth had been more relaxed than his partner's previous birth experiences at the hospital (interview: A, 26 November 2022).

Another father told us that his partner had not received the same number of midwife appointments and health visits as she would have done in 'normal' times. He recognised that the services were 'not functioning as they normally would. I understood that. It [the care] was good for the situation' (interview: L, 26 November 2022).

One of the fathers described the situation when his wife went into labour as ‘a little bit eerie at times’:

> So the hospital we had been with the whole time, they had no beds for us and then we got sent elsewhere. ... and it [the other hospital] was empty, it was post-apocalyptic, yeah it was quite scary. But we got back from there [because his partner’s labour was not advanced enough for her to be admitted] and it so happened that when my partner was actually ready to give birth, we could actually get into the hospital which we had been with the whole time (interview: T, 26 November 2022).

The father told us that he understood that from a medical point of view his partner was not ready to give birth, but he found going to and from the hospitals stressful, as they were driving to the second hospital late at night and it was far away (interview: T, 26 November 2022).

When it came to their experiences once their partner had gone into labour, one father noted that it was weird to drop her off: ‘I had to drop her off and she’d gone into the hospital and then I had to sit in the car park, waiting for the call [and] then they called me and we were there all day until 2 o’clock’ (interview, L, 26 November 2022).Another father commented that while his partner had originally planned for two birth partners to be present, due to COVID it was only he him, which he thought put more pressure on him. However, he perceived the birthing experience as a whole as positive.

While the fathers were allowed to be present at birth, due to the COVID-19 restriction they could only stay with their partners in hospital for a short time. One first-time dad commented:

> I think that was the worst thing, after he was born I was only allowed with them for an hour and then I had to leave. But he wasn’t taking the breast, so they didn’t want to discharge her. And I think I left her at 4.00 on Sunday and I couldn’t pick them up, so in the end my partner just said I want to leave, and that was about 12.30 the next day. So you only had an hour ... you build up to it, and then he’s here and then I had him for an hour and then I had to leave... (interview: L, 26 November 2022).

While the father noted that he understood why things were like that at the time, he thought ‘that could have done more harm than good [in terms of bonding with the baby and supporting the mother]’.

Another father explained that whilst the hospital staff they dealt with were ‘great, very friendly’, there were ‘small frustrations with different things before and after she [his daughter] was born’ [interview: T, 26 November 2022]. He said that the newborn got her checkups, but his partner did not receive the same care: ‘nobody saw her afterwards’. They also struggled to get hold of maternity staff for specific queries they had. Later down the line, they struggled to book their daughter in for her immunisations due to a lack of appointments. This meant that she received some doses late, missing out on some vaccinations for which she was then too old. Moreover, her first vaccination was administered while she had a urinary tract infection, which made her very unwell and led

her to being hospitalised for a short period. The father noted: 'it feels like we should have been advised not to have given her the needle [vaccination] while she was so ill'. He told us that he recognised the professionals were dealing with a lot of children, sometimes he felt like they were 'a little cold ... sort of 'you're in and out', not as warm as you'd like them to be sometimes' (interview: T, 26 November 2022). The parents also struggled to get their daughter weighed and found it hard to access the health visitor services. The father acknowledged that at times the services were amazing and thought that they probably remembered the problems more because of the emotional effect they had on the parents, as they felt protective of his their child (interview: T, 26 November 2022).

Finally, one father commented that in the immediate few months after the birth, he missed the family support he had anticipated they would receive. Instead, due to COVID 'it was just us' and family members were 'looking at [first grandchild on both sides] through the window for the first two months' (interview: L, 26 November 2022).

8.8. Discussion

A wide range of quantitative data was collected as part of this report, along with in-depth qualitative data which addressed the experiences of mothers and fathers whose children were born during the height of the COVID-19 pandemic (between March 2020 and August 2021). The data highlights a range of areas for action when it comes to planning maternity services.

Throughout this report, indicators show that perinatal and birth outcomes are worse for women who live in areas where social and economic deprivation is high, who come from ethnic minority backgrounds or who have medical co-morbidities. Whilst more local data is needed to differentiate among the outcomes for women with different characteristics in order to assist with more targeted maternal health initiatives, it is clear that across the local authorities, deprivation correlates with worse maternity outcomes.

Within the footprint of Cheshire and Merseyside are some of the most deprived communities in England (also see Marmot et al., 2022). As noted, Liverpool ranked second with regards to the proportion of LOSA's which are in the most deprived 10% nationally and Knowsley ranking third, with Halton, St. Helens, and the Wirral also ranking relatively highly. In 2019, around a quarter of the local population lived in income deprivation in Knowsley (25.1%) and Liverpool (23.5%) and also Halton (18.5%), St. Helens (18.2%), and Wirral (17.4%) had very high levels. In line with ample evidence that socio-economic factors impact on health behaviours and the health of populations (the social determinants of health) (Marmot, Allen and Goldblatt, 2010; Marmot, Goldblatt and Allen, 2010; Marmot et al., 2022), the levels of deprivation in the local authorities correlate with a worse performance across a range or indicators (for instance, obesity, levels of type 2 diabetes, levels of smoking at booking appointment and at birth, folic acid use and breastfeeding levels at 6-8 weeks).

In 2020, the percentages of residents who identified to be from an ethnic minority background were lower across Cheshire and Merseyside than the national average (see section 2.2). Liverpool had the highest percentage of residents who identified to be from an

ethnic minority background (15.78%), equating to around 78,694 individuals. Cheshire East had the second highest percentage (10.21% - 38,806), followed by Wirral 7.10% (23,015). As noted, the inclusion and equal treatment of women who identify to be from an ethnic minority background is a key a focus of maternity service providers. Whilst, as explained, we do not treat the evidence from the in-depth qualitative interviews specifically as experiences of women from an ethnic minority background, there are clear issues which other recent reports have highlighted as disproportionally affecting women from ethnic minority back grounds, especially women who were identified as Brown or Black (Birthrights, 2022; Peter and Wheeler, 2022). Such issues include a lack of choice when it comes to birth options, the denial of pain relief, a downplaying of women's symptoms and pain, and a lack of facilitating women's choices. As has also been identified in other recent reports, the maternity services must continue to address overt or unconscious biases and racism, and continue to work on ensuring that women receive excellent levels of care (Knight et al., 2014; Knight et al., 2015; Birthrights, 2022; Knight et al., 2022; Peter and Wheeler, 2022).

Moreover, the qualitative data also show that there were organisational issues within the services which affected women's care, which were not all attributable to the exceptional strain put on the services by the COVID-19 pandemic. This included firstly, the reduced number of routine appointments, secondly, issues with a lack of coordination between care providers and thirdly, a lack of clear communication between care providers and the women their pregnancy journey and/ or when in labour. The evidence suggests that women were not made sufficiently aware of the procedures and policies surrounding labour and hospital admissions (a repeated theme being that women arrived in hospital when their labour had not been well established and had to return home), not sufficiently informed about the birthing options available to them, not informed about how their choices in birthing location would impact the level of care that they could receive. This highlights an urgent need to provide this level of information during routine pregnancy appointments.

Lastly, several women asked us to pass on the message that they wanted to be treated with compassion, kindness and respect. As one woman said: 'Please, please, if you pass [on] my message, for all midwives, please treat us well' (focus group: H, 29 September 2022). Women in labour tend to be nervous, feel vulnerable, sometimes feel confused and are in pain. They require being looked after, rather than having to fight for appropriate treatment and that their choices are being respected. Clear communication with regards to what is happening to them and their infants is also key.

Evidence from the analysis of the quantitative data raises the following further issues:

The national and local populations are increasing year by year, which requires careful planning in staffing levels. Repeated reports have highlighted shortages in staff across the NHS also in the light of shortages created by BREXIT, and there is a particular shortage in midwives which affects the levels of provision of local care (e.g. 'State of Maternity Services' reports).[218] This continues to be a national and local area for concern. Counter to the national trend, conception rates in five of the local authorities featured in the JSNA are

[218]See New 'State of maternity services' report released (rcm.org.uk) [accessed: 16 December 2022].

increasing (Cheshire East, Cheshire West and Chester, Halton, Knowsley and St. Helens). And six had rates that were higher than the national rate (Cheshire East, Cheshire West and Chester, Halton, Knowsley, St. Helens and Wirral). Abortion rates have also increased nationally and across all local authorities, most likely because there is an increased level of awareness with regards to the services available, increased accessibility and improved provision. Still, in 2020, four local authorities had a general fertility rate that was higher than the national rate (55.3 live births per 1,000 for women aged 15-44) (Cheshire East, Cheshire West and Chester, Knowsley and St. Helens). The local authority area with the highest general fertility rate was Knowsley (61.4 live births per 1,000 for women aged 15-44), followed by St. Helens (57.1) and Cheshire East (57.0). There will be a higher demand for maternity services and maternity service staff in those particular localities where the fertility rate is on the rise.

The national teenage conception rate has seen a year-on-year decrease. When compared with the 2013 figures, the rate in 2020 had also dropped significantly across all local authorities, with Liverpool and Sefton seeing the highest decreases. Percentages of conceptions leading to abortions are higher than the national average (53.0%) in a number of local authorities. Warrington (77.4%), Knowsley (65.6%), and Cheshire East (61.1%), and Liverpool (57.3%) have the highest percentages.

With regards to the percentages of mothers who are under the age of 18, five local authorities (Cheshire West and Chester, Halton, Warrington, Knowsley and St. Helens) had percentages that were higher than the national average (0.6%) in 2020. St. Helen's had the highest proportion of births to mothers under the age of 18, 1.3%. This was however a drop of 0.8% from the percentage recorded for 2013-2014 in the MSNA 2016 (2.1%) (Lewis et al., 2016, p.22). The data suggest that while teenage pregnancy prevention programmes have had a positive effect on teenage pregnancy rates over the years, more targeted local interventions are needed especially in the localities where the percentage of teenage mothers is higher than the national average.

Over recent years flu vaccination levels have been decreasing nationally despite a recent increase in uptake in 2020-2021. Only two local authority areas had an uptake that was higher than the national average (Cheshire East and Cheshire West and Chester). Liverpool and Knowsley had the lowest uptake. Also levels in the uptake of the pertussis vaccine are lower across all nine local authorities than the national average – highlighting a clear area for action in terms of awareness raising campaigns.

Early booking continues to be a key concern in order to ensure that women receive the care they need from the outset of their pregnancy. Six out of nine local authorities had percentages that were higher than the England average, but levels in Warrington, St. Helens and Halton were lower, highlighting a further area of targeted local action with regards to awareness rising to ensure early booking.

Ensuring that women are aware of the options available to them in terms of birthing location also continues to be a concern. As our qualitative data indicate, even women who already had one or more children were not always aware what choices were available and what these choices entailed. With regards to home births, national percentages continue to

be low (2.3%). Three of the local authorities had percentages lower than the national average: Halton, Knowsley, and St, Helens had the lowest with 1.2%.

In 2020/2021, one third of births nationally and also the nine local authorities were by caesarean section, representing a nearly 10% increase to the levels recorded for 2013/2014. This increase in levels of birth by caesarean (both, elective and emergency) merits further investigation.

The stillbirth rate in a number of local authorities was higher than the national average (3.8 per 1,000 births) in Warrington (4.6), St. Helens (4.4), Cheshire East (4.3) Halton (4.0) and Knowsley (3.9). As mentioned in section 7.10, among risk factors in stillbirths and are obesity, smoking during pregnancy, diabetes and mental health problems, increased levels of which are linked to levels of socio-economic deprivation. Levels of smoking and obesity are higher than the national average in a number of local authorities. As the sections on smoking at 'booking' for 2018/2019 and at 'birth' for 2020/2021 show, at booking only three local authorities had percentages that were lower than the national average and at birth only Warrington (8.2%) had a percentage that was lower than the national percentage (9.6%). Also obesity levels were higher than the national average in many local authorities for the general population, as well as for women as recorded at their booking appointments. With 40.3%, Knowsley, was the local authority with highest obesity level across all national local authorities in 2020/2021, compared to 24.3% of the national population. When it came to women's obesity levels at the booking appointment, only two local authorities had percentages in 2018/2019 which were slightly lower than the national percentage (22.1%) were Cheshire West and Chester (21.1%), Sefton (21.8%). The fact that most of these authorities also have high levels of deprivation highlights the need to continue with campaigns to address the wider determinants of health and highlights the need for a holistic approach to address these inequalities.

The infant mortality rate was higher in five local authorities than the national average (3.6 per 1,000 live births) in 2020. Knowsley had the highest rate (5.5 per 1,000) followed by Liverpool (5.2 per 1,000), again highlighting the correlation between the infant mortality rate, the wider social determinants of health and levels of deprivation.

Newborn hearing screening services were negatively affected by the COVID-19 pandemic, which led to the closure of audiology departments, delays and a lower coverage of home visits. The local authorities of Liverpool, St. Helens and Knowsley did not meet the required threshold and it remains to be seen how the services recover post-pandemic.

Lastly, with regards to breastfeeding, all local authorities had lower rates for breastfeeding at 6-8 weeks in 2020-2021 than the national average (47.6%). The lowest levels were recorded for Knowsley, St. Helen's and Halton. Given the established benefits of breastfeeding for mother and infant, this highlights a clear area for continued action.

9. Evidence based recommendations

9.1. Recommendations for commissioners

Some of these recommendations repeat here those raised by Lewis et al. in the MSNA (2016), as they continue to be relevant:

- Develop in-depth accounts of the socio demographic context of each maternity trust area, and identify vulnerable populations to develop targeted policies in order to enhance performance and care for all sectors of the population.
- Review levels of communication between services, and streamline communication.
- Any changes to services and care need to be considered in a holistic way for women and families, so that any local needs are taken into account.
- Continue to ensure the most vulnerable groups who are at increased risk of morbidity and mortality, are identified, and have access to an enhanced level of service.
- Continue to facilitate greater involvement of service users in the development and improvement of local services.
- Conduct a review into reasons behind the rise of births by caesarean sections.
- Develop a solid strategy to deal with various public health issues that impact on the stillbirth rate, such rising obesity levels and linked type two diabetes diagnoses, as well as levels of smoking and alcohol consumption.
- Develop a strategy to ascertain the local level of FASD in the population and highlight the impact of alcohol on pregnancies.

9.2. Recommendations for acute trusts and midwifery teams

Again, some of these recommendations repeat those raised by Lewis et al. in the MSNA (2016), as they continue to be relevant:

- Ensure that women are aware of where to book in when they find out that they are pregnant, and that they are aware of the need to do this as soon as possible (e.g. signposting in chemists, health centres, GPs etc). Local information sources and access mechanisms should be available so that women can access maternity services as early as possible in the pregnancy.
- Early in the pregnancy, midwives should provide women with information and opportunities to discuss their views on what their options are about where they will give birth, so women are able to discuss this with their families and make an informed choice.

- Ensure that women with their second and subsequent pregnancies are clear about their choices. Their previous experiences might have been in a different local authority, Trust or country and they might not be aware of the local options available.

- Ensure that parents are able to make informed choices on how they would like to feed their baby, in line with UNICEF UK Baby Friendly Initiative Standards and support parents in their choices.

- Allow sufficient time for the first 'booking in' appointment, and ensure that it covers all relevant topics, even when women already have older children. Lifestyle advice should be provided at this appointment.

- Ensure there is flexibility in when parents can attend antenatal classes, offer classes in the evenings and at weekends where possible, to meet the need sof working families. Consider amplifying the provision through providing online classes via zoom, teams etc to facilitate that parents who might otherwise struggle to access services can participate.

- Facilitate interaction between parents, so that they can get to know other parents and access crucial peer support, again, consider to provide online options.

- Ensure that fathers have adequate opportunities to raise issues that are concerning them, and that they have the advice that they need.

- Ensure that all parents are offered adequate advice at all stages of the childbearing continuum, even if they already have older children. Again, parents' experiences might have been in different local authorities, countries and cultural contexts and they may require information on local procedures and services available.

- Given the restriction on the possibilities for the whole family to bond following the birth ofa baby, ensure the re-establishment of such possibilities.

- Consider more open visiting hours for partners.

- Ensure that women know where to access child-care for older children, when they are attending antenatal classes, and when they are in labour and when they need to go into hospital or other care settings for treatment.

- Provide support to breastfeeding mothers if they need to seek medical help post-birth so that their infant can be with them and breastfeeding is not disturbed.

- Ensure that women are supported to understand the labour process and that they know where to access the support that they need when they are in labour, including, when applicable, in the early stages of labour before they are admitted to hospital.

- Ensure women are clear about hospital procedures and how to identify the point when they should travel to hospital during the labour process.

- Provide parents with sufficient information about the risks and benefits of interventions during labour, so that they are able to make an informed decision.

- Make parents aware of the risks of such factors as smoking and alcohol consumption during pregnancy, develop more targeted campaigns around these issues.

- Provide parents with information about the benefits (and risks) of vaccinations during pregnancy.

- Provide more information for women who have had a Caesarean section. This might include verbal information from midwives or other relevant health professionals, both before (in the case of a planned caesarean) or after the birth. Consider developing, or signposting women to, an app providing advice, and provide a written pack giving information, although literacy levels must always be taken into account.

- If the birth is difficult, provide mental and emotional support.

- Ensure that community services are resourced to deliver the above, as the community midwifery service is the hub of many improvements and changes.

- Remind midwives and other healthcare workers of their responsibility to treat birthing people with care, respect and empathy, to respect women's previous experiences and facilitate their choices wherever possible (and in line with medical best practice).

- Remind healthcare professional to maintain open and clear communication throughout the care process. This might also involve that translators or advocates are present, if clear communication cannot otherwise take place.

9.3. Recommendations for University

- Conduct more research on specific correlations between various indicators and their link to socio-economic factors as evidence base for targeted interventions (for instance, levels of education and the under-age conception rate, or levels of deprivation and early booking).

- Conduct in depth research on links between ethnicity and maternity outcomes on a local scale in all nine local authority areas to develop detailed recommendations.

- Conduct a wider study combining qualitative and quantitative methodology to capture views of the maternity system in a post-pandemic situation, drawing on a wide sample of the local population, including birthing people in general and fathers.

- Repeating the recommendation by Lewis et al. (2016, p.69): conduct interviews with midwives, to gain a better understanding on what would help them to carry out their roles.

- Repeating the recommendation by Lewis et al. (2016, p.69): Facilitate greater emphasis and support for public health issues as part of maternity, and increased awareness of the public health role of the midwife.

- Conduct detailed research on obstacles to inclusion for sectors of the population who struggle to access maternity services (e.g. because they face issues with charging for services – such as asylum seekers) or whom the maternity services struggle to engage with (gypsy populations, asylum seekers and others).

- Conduct a detailed analysis of levels of deprivation and ethnic composition of the population in the local authorities as the new census data is released in 2023 to inform targeted policy making.

10. Conclusion

In conclusion, the data in this JSNA demonstrate that local authorities within the footprint of Cheshire and Merseyside repeatedly fare worse than the national average, or counter national trends across a range of indicators. Among the exceptions is notably the indicator 'complex social factors', where the authorities had percentages lower than the national average for women who are recorded to have complex social factors at the time of their booking appointment.

In line with the findings of the MSNA (2016) key areas for action continue to be breastfeeding support, perhaps by adopting models of good practice from areas where breastfeeding rates are higher. Wider public health issues such as rates of smoking during pregnancy, as these are still higher than the national average in several local authority areas, and obesity levels, which are particularly high in Knowsley. Linked to this is also an increased awareness around and support for women with Type 2 diabetes who plan to become pregnant or are pregnant. Teenage pregnancy rates; although these have decreased they are still high in some areas, and this should be addressed through targeted action.

The interview data show that the COVID-19 period as such did not have a hugely disruptive influence on the experiences of the women and many women were happy with the (aspects of) the care they received. The fact that partners were limited in the time that they could spend in hospital with the mothers and newborns, and therefore having little time to initially bond with the infant, is likely to have been an issue for many families. Moreover, there were organisational issues within the services which affected women's care, which can be attributed to the COVID-19 pandemic, but not in its entirety. This included 1) the reduced number of routine appointments, 2) issues with a lack of coordination between care providers and 3) a lack of clear communication between care providers and the women their pregnancy journey and/ or when in labour. Other key issues were that women were 1)

not made sufficiently aware of the procedures and policies surrounding labour and hospital admissions, 2) about the birthing options available to them and 3)about how their choice in birthing location would impact the level of pain relief they could receive. Some women also encountered a lack of compassion, and a lack of support for their choices in labour and birth. More ‘kindness’, compassion and ultimately respect for the knowledge they had of their own bodies and their choices were among the key messages that the women asked us to pass on.

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[i] Whilst it is beyond the scope of this document to discuss the use and politics of collective identifiers and ethnic labels further, it is important to point out that the term 'black, Asian and minority ethnic' ('BAME') is problematic and has recently come under much criticism. This includes for instance, that the term masks the differences and outcomes between the ethnic groups which may be included in the category. Moreover, critics note that term suggests that the root 'of all disparities must be majority versus minority discrimination' (Commission on Race and Ethnic Disparities, 2021, p.32). A third criticism levelled against the term is that it is often employed in a way that suggests that BAME stands for non-White or non-majority ethnic people or groups, which individuals may find this demeaning and discriminatory. Lastly, critics point out that the term excludes people who identify themselves to be from a White ethnic minority background (e.g. see DaCosta, Dixon-Smith and Singh, 2021). This has lead UK government institution, sectors of the media and other private and public sector institutions, including the LJMU, to no longer use the terms (see for instance, the report by the Commission on Race and Ethnic Disparities (2021), Why we no longer use the term 'BAME' in government - Equality Hub (blog.gov.uk), 'BAME' term offends those it attempts to describe, sporting survey finds | Sport | The Guardian, accessed: 12 January 2023).
In our report we may use the term 'black, Asian and minority ethnic' when discussing literature and reports which still employ the term. Otherwise, wherever the available data allows, we seek to be as precise as possible in the language of identification (be it ethnic markers featured in census or health surveys, or modes of self-identification at an individual's level). If a broader category is required, we follow LJMU policy which is to use the more inclusive 'ethnically diverse' or 'ethnic minority' is an alternative to 'BAME' (see: https://www.ljmu.ac.uk/about-us/news/articles/2022/9/28/ethnically-diverse-and-ethnic-minority-to-substitute-the-bame-acronym-across-ljmu?utm_campaign=2216608_Staff%20Newsletter%2029%20September%202022&utm_medium=dotmailer&utm_source=email%20marketing&dm_i=2SCX,1BICG,8D9C9T,55K4F,1, [accessed: 12 January 2023].