

Report focus

Building on the findings shared in two earlier reports in the series, this research starts to develop the evidence base on the health needs of mothers and babies who come into care proceedings. It aims to help provide insights into the kind of intensive early intervention that might be needed.

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Born into care: One thousand mothers in care proceedings in Wales

Maternal health, well-being, pregnancy and birth outcomes



About this report

This report provides a profile of the maternity and birth characteristics of birth mothers appearing in care proceedings with an infant in Wales. It is the third report in the Born into Care series. It follows:

- Broadhurst, K. et al. (2018). *Born into care: Newborns in care proceedings in England*. London: Nuffield Family Justice Observatory
- Alrouh, B. et al. (2019). *Born into care: Newborns and infants in care proceedings in Wales*. London: Nuffield Family Justice Observatory.

A Welsh language version of this report is available from www.nuffieldfjo.org

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The data used in this study is available from the Secure Anonymised Information Linkage (SAIL) Databank at Swansea University, Swansea, UK, which is part of the national e-health records research infrastructure for Wales. All proposals to use this data are subject to review and approval by the SAIL Information Governance Review Panel (IGRP). When access has been granted, it is gained through a privacy-protecting safe-haven and remote access system, referred to as the SAIL Gateway. Anyone wishing to access data should follow the application process guidelines available at: www.saildatabank.com/application-process

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About the Nuffield Family Justice Observatory

Nuffield Family Justice Observatory (Nuffield FJO) aims to support the best possible decisions for children by improving the use of data and research evidence in the family justice system in England and Wales. Covering both public and private law, Nuffield FJO provides accessible analysis and research for professionals working in the family courts.

Nuffield FJO was established by the Nuffield Foundation, an independent charitable trust with a mission to advance social well-being. The Foundation funds research that informs social policy, primarily in education, welfare, and justice. It also funds student programmes for young people to develop skills and confidence in quantitative and scientific methods. The Nuffield Foundation is the founder and co-founder of the Ada Lovelace Institute and the Nuffield Council on Bioethics.

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Population Data Science
at Swansea University



Foreword

The rapid rise in the number of babies who have been taken into care in recent years has raised lots of questions, but most importantly: what can be done to prevent such steps being necessary?

This report, the first of its kind to link family court records to maternal health data in Wales, paints a picture of the health needs of both mothers and babies who come into care proceedings. In doing so, it helps us to better understand the kind of intensive early intervention that might be needed.

It reveals the scale of the mental health challenge. The findings are striking: over half of the pregnant mothers in this study reported an existing mental health condition at their initial antenatal assessment and three-quarters experienced a mental health-related GP or hospital appointment.

Interestingly, the study also busts some potential myths. Pregnant women who go on to have babies removed at birth are not unknown to maternity services; indeed the majority are booked for antenatal care in the first trimester of pregnancy. This exploratory work has also found that babies taken into care at birth do not appear to be significantly less healthy than their peers at birth, although slightly more are born pre-term and with low birth weights than babies born to mothers not subject to care proceedings.

Such insights offer decision-makers valuable information to help shape future provision.

Nuffield Family Justice Observatory (Nuffield FJO) is dedicated to improving life for children and families by putting data and evidence at the heart of the family justice system. I am grateful to the teams at the Centre for Child and Family Justice Research at Lancaster University and Population Data Science and the SAIL Databank at Swansea University for continued ground-breaking data analysis.



Lisa Harker
Director, Nuffield Family Justice Observatory

Executive summary

This is the first population-based study to link family court records to maternity and other health data relating to birth mothers in care proceedings in Wales. Our findings highlight the vulnerabilities of women whose babies are subject to care proceedings in the first year of life, including the very high proportion with significant prior mental health conditions at or before attending antenatal care. The findings support the Welsh government's current policy of investing in mental health perinatal services, and suggest that mental health should be given greater priority in all children's social care pre-birth assessments. In addition, they highlight that more needs to be done to address maternal substance use and smoking during pregnancy.

Mothers experienced greater levels of socio-economic, health and well-being vulnerabilities prior to and/or during pregnancy than the comparison group.

- Entry to motherhood was early, with half (53%) doing so as teenagers.
- The majority (76%) lived in the two most deprived areas of Wales (quintiles).
- Over half (53%) reported an existing mental health condition at their initial antenatal assessment, while three-quarters (77%) had a mental health-related general practice (GP) or hospital contact or admission recorded in their health records.
- Two-fifths (38%) were documented as ever having had a substance use-related GP or hospital contact or admission prior to the child's birth.
- Nearly two-thirds (63%) were recorded as smokers at booking and 60% at childbirth.
- Over a quarter (28%) of mothers were obese (BMI 30+) at initial assessment.

The majority of mothers booked for antenatal care in the first trimester of pregnancy, although overall this tended to be later than mothers in the comparison group.

- Nearly half (46%) had their initial antenatal assessment by the end of the 10th week and two-thirds (63%) by the end of the 12th week. Only 5% reported a very late initial assessment at or after 30 weeks.
- Mothers who had previously given birth more than once were more likely to book later.

The majority of babies were born full-term, and had healthy birth weights and Apgar scores; however, more babies were born pre-term and had low birth weights than the comparison group.

- 14% of the mothers went into labour prematurely (<37 weeks).

What are 'care proceedings'?

Care proceedings are issued under Section 31 (s.31) of the Children Act 1989 and can lead to removal of a child from parents' care on account of actual or likely significant harm.

About the data

This study used anonymised administrative data from Cafcass Cymru combined with maternity and other health data using the highly secure systems for linkage and anonymisation established by the SAIL Databank.

The study covers a cohort of mothers entering care proceedings between 2011 and 2018. We analysed linked data available for 1,111 of these mothers and their infants (who appeared in care proceedings before their first birthday). Findings were benchmarked with reference to the general population of women accessing maternity services in Wales who were not subject to care proceedings.

- 8% of full-term babies were born with low birth weight (<2,500g); however, the majority (85%) of babies born full-term were of a healthy birth weight (2,500g to 4,000g).
- Immediately after birth the majority of babies (97%) were in a good physical condition (as indicated by Apgar scores of 7 or over).

The above findings highlight that the majority of mothers attended antenatal care sufficiently early in pregnancy to enable timely intervention and support. Midwives are pivotal in identifying and initiating support and preventive services for mothers at risk of losing their children through care proceedings. Our findings suggest an increased risk of premature delivery and low birthweights but otherwise good immediate pregnancy outcomes.

Key recommendations and next steps

- Many health needs are amenable to treatment and support if pre-birth assessment and help comes early enough. Establishing a consistently timely response across Wales, in the first trimester of pregnancy, is critical.
- Social work pre-birth assessment must be attuned to maternal mental health and broader well-being. Consultation with social workers around these findings is an important next step, to ascertain whether they feel able to identify and respond to maternal mental health, and to identify any professional training needs.
- Services also need to be responsive to the needs of mothers not already known to services, including first-time mothers.
- Smoking cessation programmes need to further understand barriers to stopping smoking during pregnancy, which may be particularly difficult for women with mental health issues.
- The findings regarding both timely and late booking need wide dissemination to refute assumptions that women at risk of care proceedings avoid antenatal services *in general*.
- There is clear opportunity for more intensive engagement with women at risk of becoming involved in care proceedings, at an earlier point. It is critical that mothers seeking early engagement receive a holistic response from midwifery services at booking, including timely referral to early help services in pregnancy, and where appropriate to children's social care.
- The findings raise questions about whether the pivotal role that midwives play in identifying women who may be at risk of care proceedings is sufficiently realised. This requires further consultation with health and social care professionals to further understand how and when referrals are made to children's social care services and other preventative services.
- A smaller group of mothers require additional and targeted support or encouragement to ensure timely engagement with antenatal services. The research provides firm evidence that the standard approach of universal antenatal services is not meeting the needs of a proportion of mothers who are booking very late in pregnancy. Here, there may be a critical role for the Reflect service in Wales, given that this service works with women who have had children removed previously, and offers an alternative approach to service engagement.
- Further analyses are required of infant outcomes beyond birth.

1. Introduction

Dr Alrouh and colleagues provided the first analysis of infants and newborn babies subject to care proceedings in Wales under Section 31 (s.31) of the Children Act 1989 (2019).¹ This initial report revealed the scale and rising numbers of babies subject to care proceedings in Wales, notably in the first year of life.² Its publication prompted pressing questions from stakeholders about the reasons behind these increases, and what else might be done, where appropriate, to prevent infants being removed from their mothers' care.³

The current report builds on these earlier findings, focusing specifically on birth mothers whose babies were subject to care proceedings in the first year of life, looking back at maternal health and well-being in and before pregnancy, interaction with maternity services, and birth outcomes. This is the first time that population-level data collected routinely by Cafcass Cymru (a Welsh government organisation that represents children's best interests in family justice proceedings in Wales) and maternal health records have been linked for research. Preliminary findings are reported here, setting the scene for more in-depth analyses that enable greater insight into women's circumstances, their physical and mental health, and adverse factors such as substance use before and during pregnancy.⁴

Pregnancy presents a vital opportunity for enhanced support and early intervention for disadvantaged women. Maternity policy in Wales emphasises the importance of the timely notification of pregnancy, and directs professionals to ensure that clear pathways of support are in place for pregnant women and their families (Welsh Government 2019a). For mothers whose infants may be at risk of care proceedings at birth or during the first year of life, timely intervention can improve maternal and fetal health, but may also avert the need for care proceedings. However, we know very little about this population of mothers in terms of their engagement with antenatal services, age profiles, overall health and well-being in pregnancy, or pregnancy outcomes. While it has been suggested anecdotally that this particular group of women attend late for antenatal care, or may conceal their pregnancy out of fear that children's services will remove the baby at birth, evidence is lacking based on robust analyses of population-level data, to either substantiate or refute these concerns.

Public Health Wales is currently leading work to improve the first thousand days of a child's life (from conception to two years of age), which includes the aim of ensuring the best possible outcome for every pregnancy (Public Health Wales 2018). Embedding a preventive approach in midwifery and social care services is in line with the policy objectives of 'A healthier Wales' (Welsh Government 2019b), which seeks to mitigate the impact of adversity

¹ If a local authority intends to remove a child from his or her parents' care or assume parental responsibility, the local authority must apply for a care order. Care orders are applied for and authorised by the family courts under s.31 of the Children Act 1989.

² Since 2015, there has been a sharp rise in both the number of newborns and infants in care proceedings (Alrouh et al. 2019, pp. 20–23).

³ Care proceedings can result in interim or permanent removal of a baby from parents' care. At the close of care proceedings, infants may return to birth parents, or be placed with alternative carers or for adoption.

⁴ Substance use can represent substance use or substance dependence, and is determined in this report through electronic searches of clinical codes used within primary and secondary health care (GP and hospital inpatient admissions), including records for example, codes for diagnoses, symptoms and medications.

and to narrow social inequalities. A number of important initiatives have been introduced in Wales, targeting socially disadvantaged women or those with mental health needs in pregnancy. A vision for accessible, specialist perinatal mental health provision within every Welsh health board was set out by the Welsh government in 2016, and updated in 2019 (Welsh Government 2019c).

Although significant progress has been made, a recent review of perinatal provision indicated that women are not able to consistently access this support across health boards in Wales (Witcombe-Hayes et al. 2018). In particular, little is known about the mental health difficulties experienced before or during pregnancy, or maternal engagement with universal or specialist perinatal mental health services by those whose babies are subsequently the subject of care proceedings in the first year of life. In particular, while substance use (alcohol and drugs) is a concern, its prevalence at a population-level among mothers who appear in care proceedings remains unclear. This study sought to address these gaps in information with a view to assessing current policy and its future development.

The findings of the current study should be considered alongside the research team's publication on women in recurrent care proceedings in Wales (Alrouh, Broadhurst and Cusworth 2020).

Methodology

Administrative data collected and maintained by Cafcass Cymru was acquired by the privacy-protecting SAIL Databank (Ford et al. 2009; Lyons et al. 2009; Jones et al. 2017, 2019). The SAIL Databank contains extensive anonymised health and administrative data about the population of Wales, accessible via a secure data sharing platform, all underpinned by an innovative and proportionate information governance model.

This study used Cafcass Cymru records linked to the following data sources:

- Welsh Demographic Service Dataset (WDSD)
- Welsh Index of Multiple Deprivation (WIMD)
- Maternity Indicators Dataset (MIDS)
- Patient Episode Database for Wales (PEDW)
- Welsh Longitudinal General Practice (WLGP) data.

The mothers included in this study were a subset of all birth mothers of infants involved in s.31 care proceedings in Wales between 2011 and 2018 inclusive. **1,111** of these mothers could be linked to their antenatal, birth and health records, defining the '**cohort**' for this study.

We examined demographic characteristics, health and well-being of these mothers, their reproductive history and interaction with midwifery services, and immediate pregnancy and birth outcomes.

Findings were compared with a general population **comparison group** (n=97,191), created from mothers who had *not* been subject to care proceedings but had antenatal, birth and health records in the SAIL Databank for the same study period.

Full methodology details are available in Appendices A to E.

Study strengths and limitations

To our knowledge, this is the first study to publish maternity and birth statistics relating to mothers involved in care proceedings in Wales. Better understanding of the needs and vulnerabilities of this group will provide opportunities to improve pre-birth services, leading to the potential for early intervention and enhanced support for these families. However, we acknowledge the following limitations.

- Studies based on administrative data are necessarily limited by the scope and quality of available data, which is collected primarily for organisational rather than research purposes. Limitations of this data, which is provided by Cafcass Cymru, are reported by Alrouh et al. (2019).
- This is the first time, to our knowledge, that the MIDS has been linked to other population-level data sources, and analysed, from within the SAIL Databank.
- In order to produce a fuller picture of the health of mothers and babies involved in care proceedings, it will be necessary to examine the linked health data further; for example, by examining health service utilisation and related illnesses during antenatal and postnatal periods (this is one of the future aims of the Family Justice Data Partnership—a collaboration between Lancaster University and Swansea University, funded by Nuffield FJO).
- The analyses in the report are descriptive and should be treated as preliminary—further analyses will be conducted, using a population-based matched cohort study design.

2. Findings

The study findings are presented as follows:

- maternal demographic characteristics, health and well-being
- maternal reproductive history and interaction with midwifery services
- immediate pregnancy and birth outcomes.

Maternal demographic characteristics, health and well-being

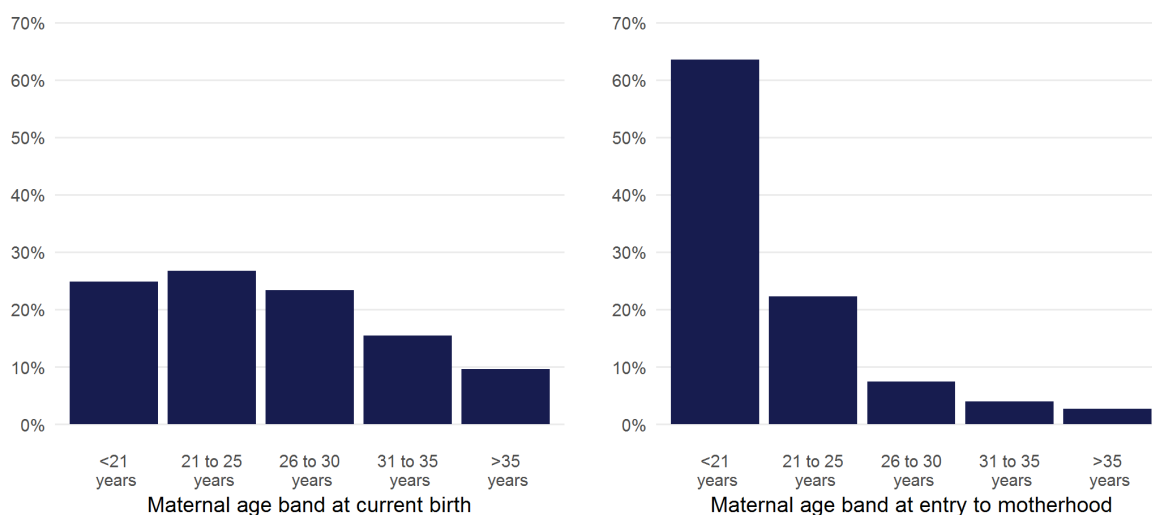
Demographics

Women in the study cohort were younger than mothers in the comparison group when measured as mother’s age at the birth of the child involved in care proceedings, and at entry to motherhood (when they had their first child).

Age at current birth

One quarter of the mothers included in this study (25%) were under 21 years old when they gave birth to the child involved in care proceedings, 75% were aged 30 or under (Figure 1), and 10% were aged over 35 years. In our general population comparison group, there were fewer younger mums (7% were under 21 years old), whilst 60% were aged 30 or under and 13% were over 35.

Figure 1: Maternal age at current birth and at entry to motherhood

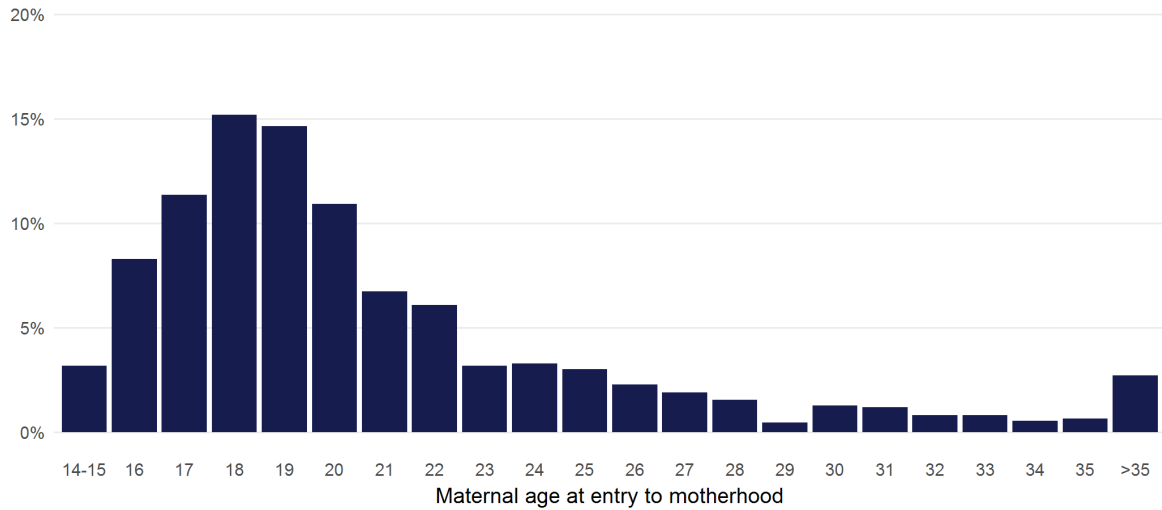


Age at entry to motherhood

Over half (53%) of the mothers included in our study had their first child (entered motherhood) as teenagers (not shown), two-thirds (64%) were under 21 years old, 93% were aged 30 or under (Figure 1), and 3% were aged over 35 years at the time of birth. Less than a fifth (17%) of mothers in the comparison group entered motherhood as teenagers, with 23% under 21 years old, and 79% aged 30 or under, with 6% aged over 35.

Figure 2 provides a more detailed picture of age at entry to motherhood. The average age of entry to motherhood was 21 years for the cohort, compared to 26 in the comparison group (not shown).

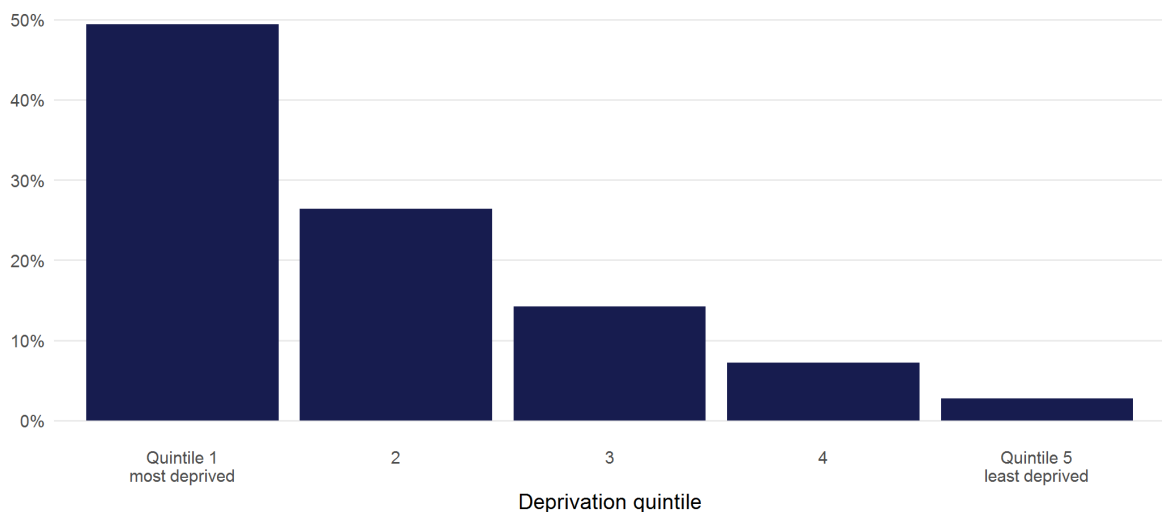
Figure 2: Proportion of mothers by age at entry to motherhood



Deprivation at childbirth

Nearly half of the women in the cohort (49%) resided in the most deprived quintile, with 76% living in the two most deprived quintiles (Figure 3). Only 3% resided in the least deprived quintile. This finding is in line with other published research (Bywaters et al. 2016; Harwin and Alrouh 2017; Elliott 2019) and adds to a growing body of literature on the relationship between deprivation and involvement in the family justice system and/or children’s entry to care.

Figure 3: Proportion of mothers by area level deprivation quintiles



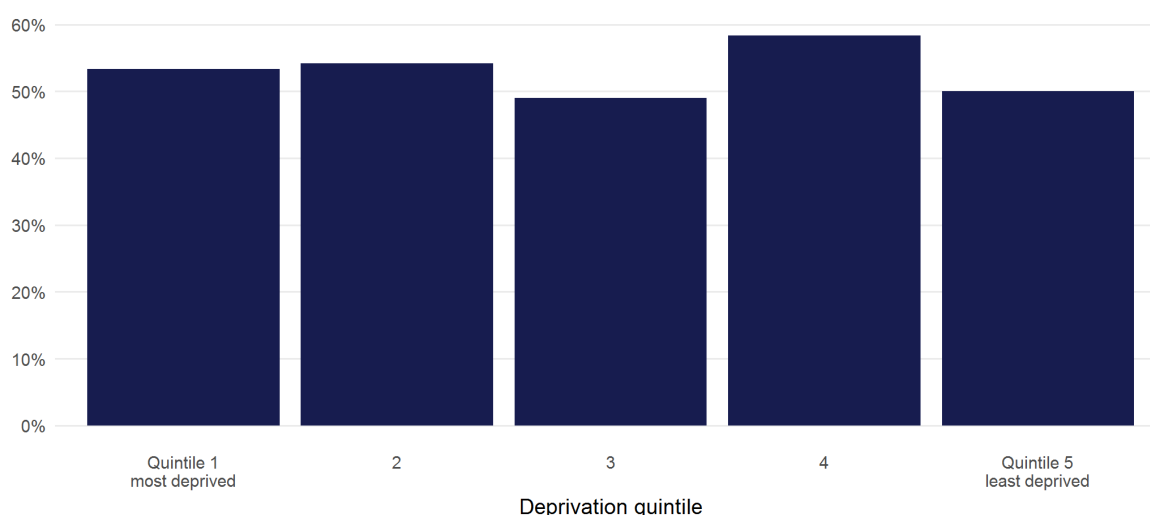
Measures of maternal mental health and wellbeing

Two measures of maternal mental health were examined—a self-reported measure captured at initial maternity assessment and a measure using linked, routinely collected electronic health records at any point prior to childbirth.

Self-reported mental health

Half (53%) of the cohort self-reported having a pre-existing mental health condition at their initial assessment. This compares to 17% in the comparison group, indicating the vulnerability of the cohort in this respect. However, the proportion of mothers in the cohort reporting a mental health condition did not vary between women living in different deprivation quintiles (Figure 4).

Figure 4: Proportion of women self-reporting a mental health condition at initial assessment (booking) within each deprivation group quintile



Mental health plan

Only around 11% of mothers had data to indicate whether they were on a mental health care plan at the time of assessment/booking, of which around 24% were on a plan, equating to less than 5% of the cohort. For the comparison group, 23% had data to indicate if they were on a plan, of which 2% were on a mental health plan, equating to less than 1% of the group.

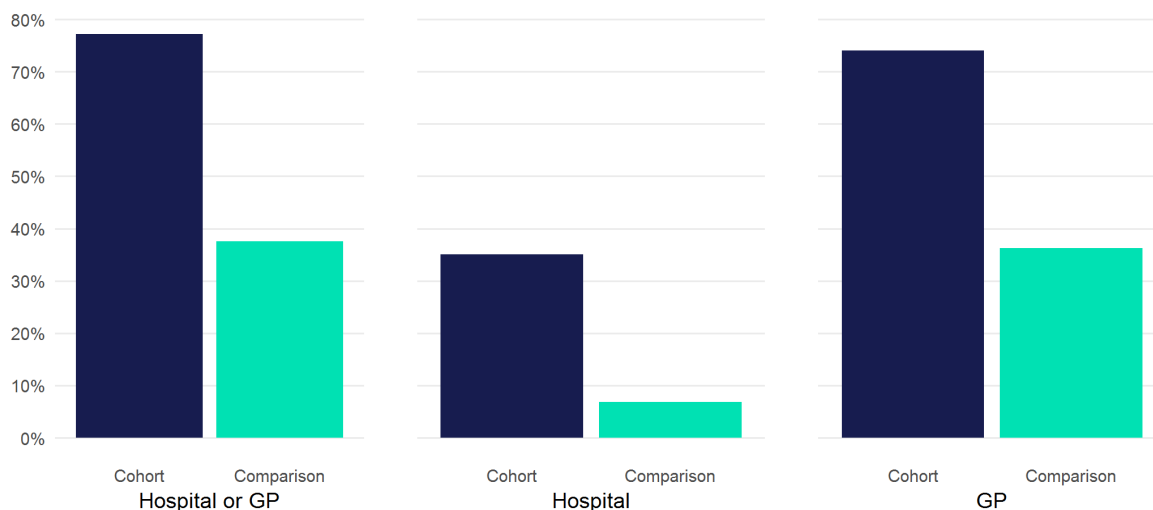
Mental health-related contacts or admissions

We report on the proportion of mothers who have a recorded mental health-related contact or admission, at any point prior to the birth of the child involved in the current care proceedings. We examined the presence of such a contact or admission in GP data and hospital inpatient PEDW data. We also report on the proportion of mothers with recorded mental health-related contacts or admissions in a GP or hospital inpatient record (i.e. a combined measure).

As shown in Figure 5, the proportion of mothers in the cohort with at least one mental health-related contact recorded in GP data was 74%—twice the proportion of the general population comparison group (36%). For both the cohort and the general population comparison group, the proportion of mothers with recorded mental health-related hospital

inpatient contacts or admissions was lower than in the GP data. There was a five-fold difference in the prevalence of hospital contacts or admissions with 35% of the cohort mothers having at least one mental health-related contact or admission recorded in the hospital data, compared with 7% of the comparison group. Overall, for the combined measure, there were twice as many women with mental health contacts or admissions in the cohort than in the comparison group (77% vs 38%).

Figure 5: Proportion of mothers with at least one mental health-related contact or admission measured using SAIL health data

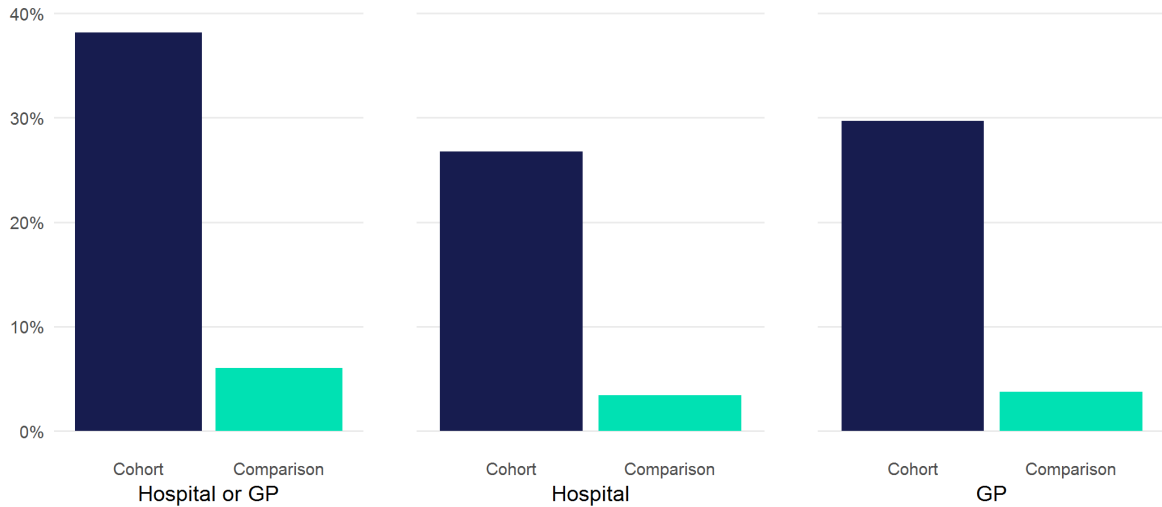


In line with our findings, a history of mental health problems has previously been found to be associated with child maltreatment and child protection involvement (Sidebotham and Golding 2001; O'Donnell et al. 2015).

Substance use-related contacts or admissions

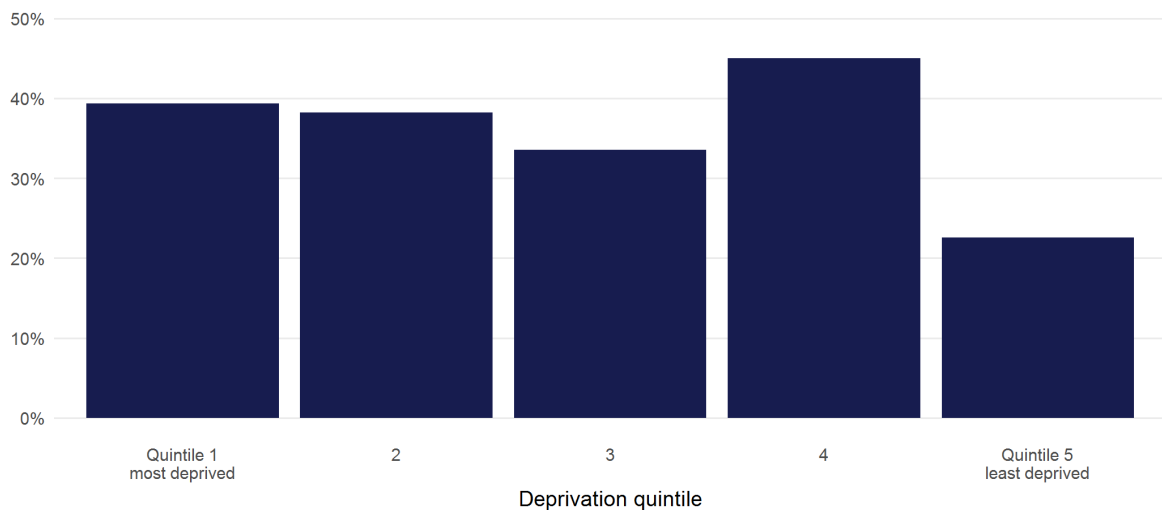
38% of mothers in the cohort were classified as having at least one substance use-related contact or admission based on combined primary and secondary health records at any time prior to the child's birth, compared with 6% in the comparison group (Figure 6). Results for GP and hospital data records separately showed similar disparity; 30% and 4% of the cohort had a GP, or a hospital record, respectively, compared to 27% and 3%, respectively, for the general population comparison group. Thus, substance use was far higher in the cohort than in the comparison group—by approximately six times.

Figure 6: Proportion of mothers with at least one substance use-related contact or admission measured using SAIL health data



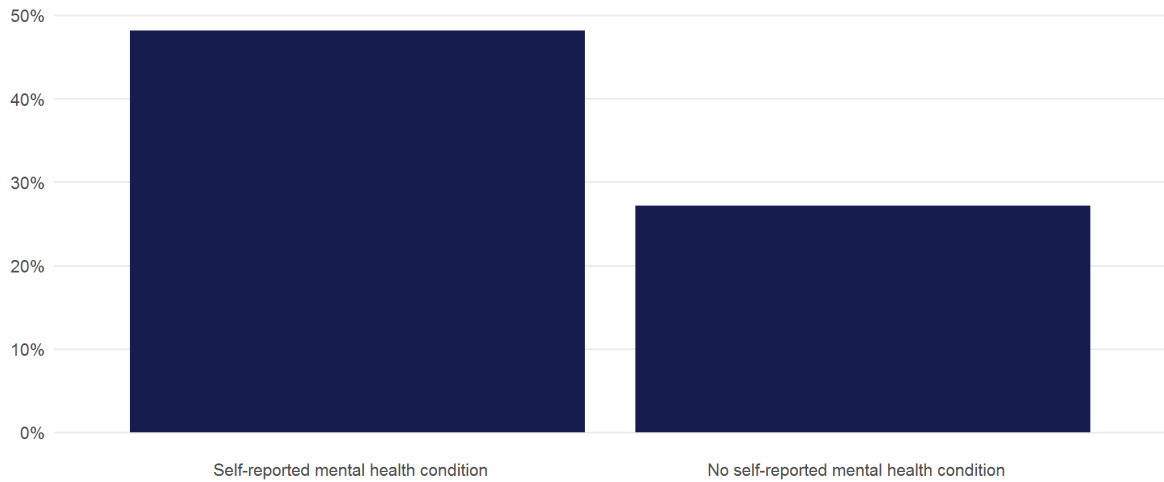
We analysed the proportion of cohort mothers with a substance use-related admission or contact by deprivation quintiles. Figure 7 shows the proportion of mothers with a substance use-related admission or contact. No clear trend was observed, although the highest prevalence was for mothers who resided in the fourth deprivation quintile, and lowest in the least deprived quintile (fifth); however, the number of women in these groups were small, so results should be interpreted with caution. Readers should note that the deprivation quintiles relate to the area level where a person lives, not specifically deprivation of the individual; highly deprived people may live in more affluent, less deprived areas, and vice versa.

Figure 7: Proportion of mothers with at least one substance use related contact or admission by area level deprivation quintiles



We also analysed the proportion of cohort mothers with substance use-related contacts or admissions by self-reported mental health conditions. Of mothers *self-reporting* a mental health condition, nearly half (48%) also had a substance use-related contact or admission (Figure 8). For those mothers with no self-reported mental health condition, this proportion dropped to 27%.

Figure 8: Proportion of mothers with at least one substance use-related contact or admission by self-reported mental health condition

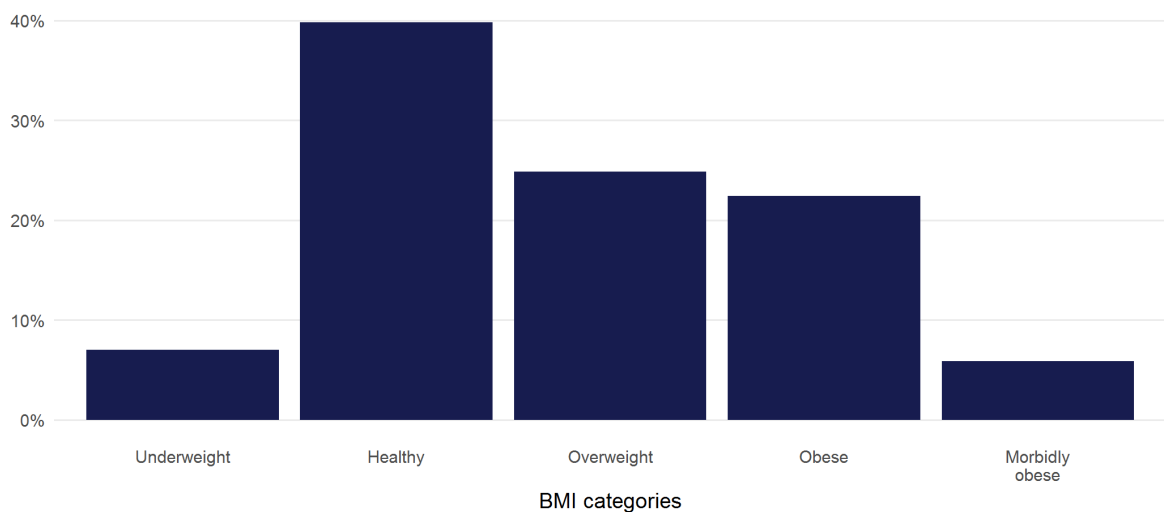


We cannot, however, conclude that substance use was, or was not, evident during pregnancy. Future analysis will investigate the specific timing and duration of substance use, but our findings concur with previous research highlighting issues of substance use in mothers of children involved in care proceedings (Roscoe, Lery and Chambers 2018).

Body mass index (BMI)

In the cohort, 7% of the mothers were underweight at initial assessment. Two-fifths (40%) had a healthy weight, a quarter (25%) were overweight (BMI 25–29.9), 22% were obese (BMI 30–39.9), and 6% were morbidly obese (BMI \geq 40) (Figure 9). Within our comparison group, fewer were underweight (2%) but 29%, 22% and 4% were overweight, obese or morbidly obese respectively, suggesting a very similar weight profile between the groups.

Figure 9: Proportion of mothers by BMI classification

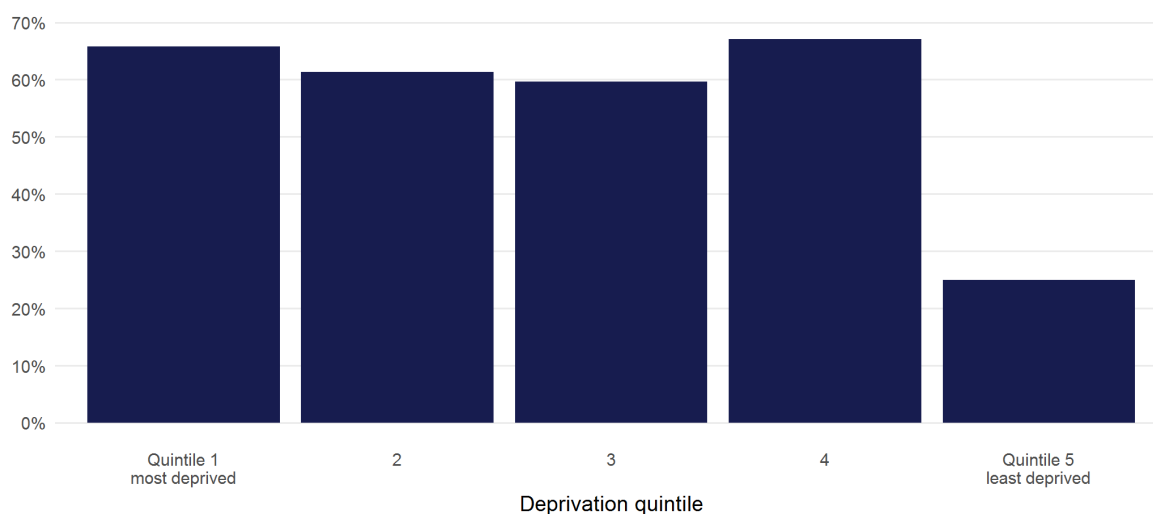


Smoking status during pregnancy and at birth

At every contact with women during pregnancy, midwives ask women if they smoke and, when possible, their response is validated via carbon monoxide testing. Overall, 63% of the mothers in the cohort were smokers at booking and 60% at childbirth. This compares to just 17% and 15% at each time point, respectively, of the mothers in the comparison group.

We analysed the proportion of smokers at booking for each deprivation quintile (Figure 10). A lower proportion of the mothers living in the least deprived areas were smokers (25%) compared to around 60%–67% of women living in all other areas.

Figure 10: Smoking status at initial assessment by deprivation group



Intention to breastfeed

Around a third (36%) of the mothers intended to breastfeed their babies, compared to almost two-thirds (63%) of mothers in the comparison group.

This finding is not unexpected given the demographic profile of the mothers and that the likelihood of initiating breastfeeding has been found to be 40% lower in the most deprived neighbourhoods of the UK (Peregrino et al. 2018).

Maternal reproductive history and interaction with midwifery services

Reproductive history

Pregnancies

The women in the study reported between one and eight previous pregnancies. This was the first pregnancy for 25% of them at the time of their initial antenatal assessment, with 20%, 17% and 37% reporting two, three, and four or more pregnancies respectively.

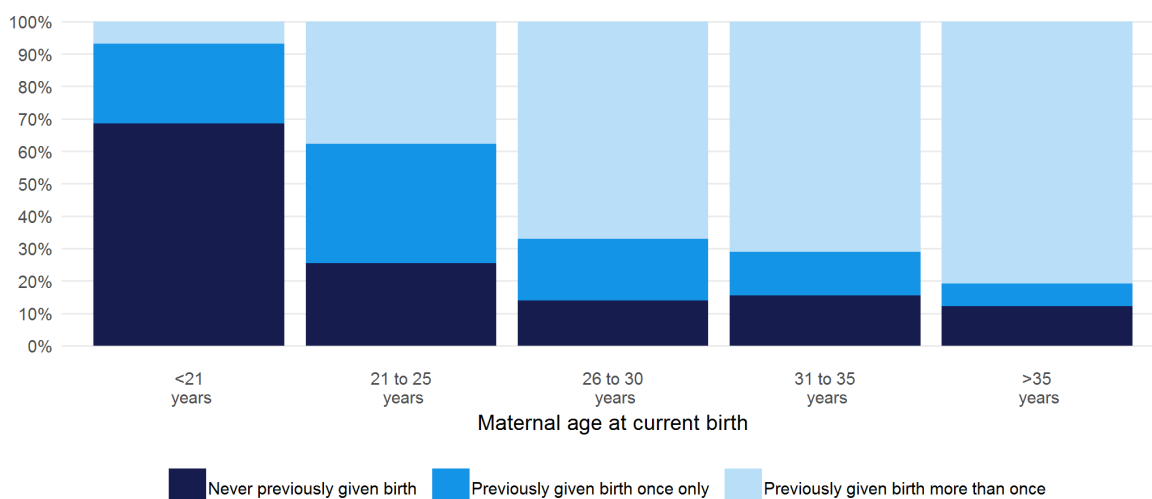
Previous live births

At the point of giving birth, this was the first live birth for 30% of the women (initial assessment data classed them as never having given birth previously). It was the second live birth for 23% of the women (initial assessment data classed them as having given birth once previously), with the remaining 46% of women giving birth to their third or more child

(at initial assessment they were classed as having had two or more previous births).

As expected, mothers who had given birth to more babies were older: only 12% of mothers aged over 35 years had never previously given birth, compared with 69% of mothers aged under 21 years (Figure 11). For the comparison group, only 27% of mothers aged over 35 years had never previously given birth, compared with 83% of mothers aged under 21 years.

Figure 11: Maternal age by history of live births



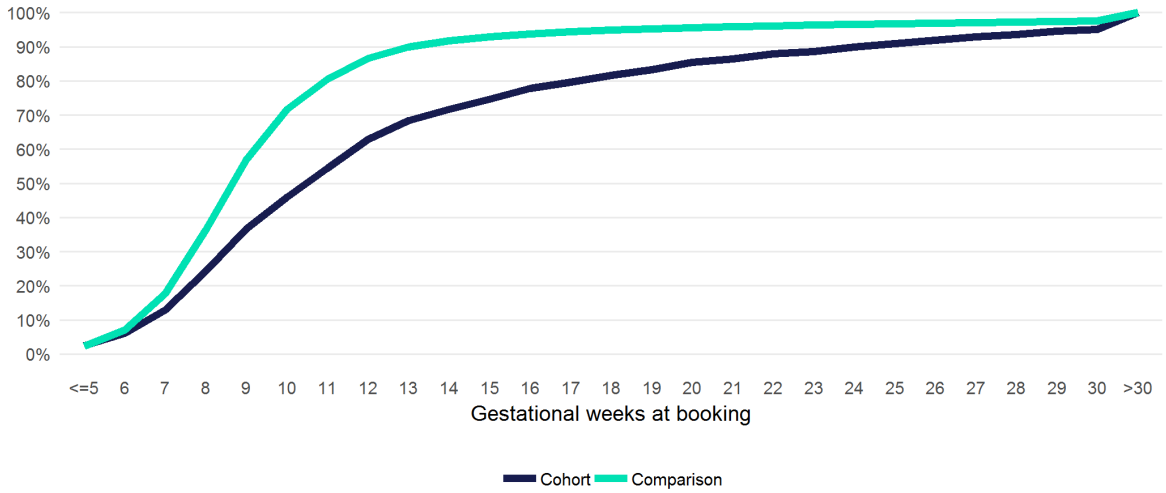
Interaction with midwifery services

Gestational age at initial booking

Almost half (46%) of the mothers in the cohort had their initial antenatal assessment by the end of the 10th week of pregnancy (Figure 12),⁵ and two-thirds (63%) had completed by week 12. Therefore, a sizeable proportion were known to services within the first trimester of pregnancy. However, one in five (22%) of the cohort mothers did not book until after 16 weeks, with a small number (n= 51 or 5%) having a very late recorded booking (after 30 weeks). In the comparison group, 87% booked within the first trimester.

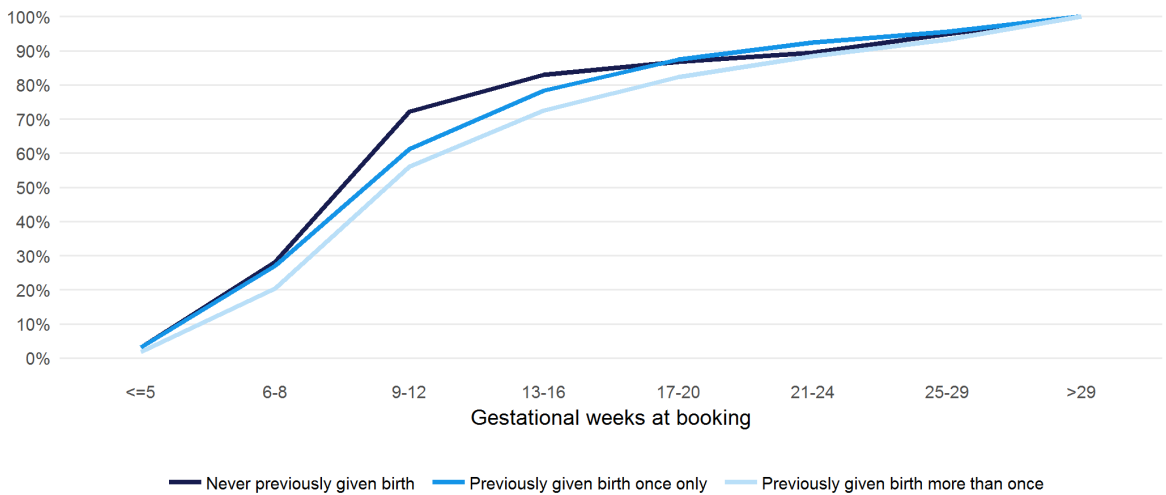
⁵ The 'proportion of women whose initial assessment has been carried out by 10 completed weeks of pregnancy' was one of the original Welsh Government Maternity Indicators, to promote and improve the health and well-being of pregnant women early.

Figure 12: Cumulative proportion of mothers booking with maternity services by gestational age



To further probe interaction with midwifery services, we also investigated variations by the gestational age at booking by previous live births. Three-quarters (72%) of women who had never previously had a live birth had booked in by the end of 12 weeks of pregnancy, compared with 61% of those who had previously given birth once, and 56% of those who had previously given birth more than once (Figure 13). The comparison figures for the general population comparison groups were as follows: 87% of women who had never previously had a live birth had booked in by the end of 12 weeks of pregnancy, compared with 88% of those who had previously given birth once, and 83% of those who had previously given birth more than once.

Figure 13: Cumulative proportion of mothers booking with maternity services by history of live births



Immediate pregnancy and birth outcomes

Mode and location of birth

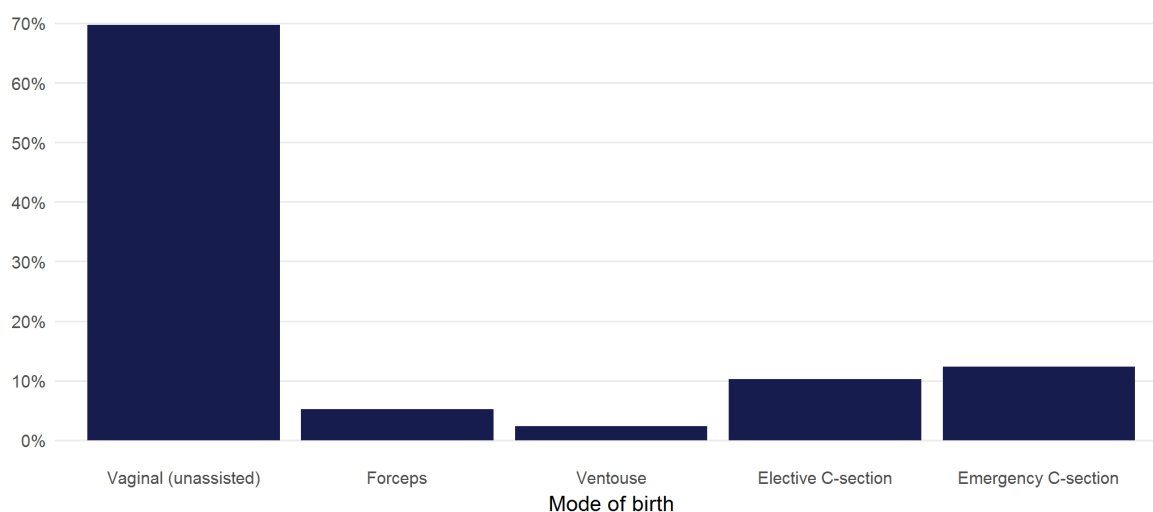
Place of birth

The majority ($\geq 99\%$) of women in the cohort and the general population comparison group had their baby in a hospital setting.

Mode of birth

Over two-thirds (70%) of cohort births were vaginal (unassisted), with nearly a quarter (22%) of women delivering their baby via caesarean section (10% elective and 12% emergency) (Figure 14). The remaining 8% of women had instrumental deliveries (forceps cephalic deliveries and ventouse (vacuum) deliveries). In the general population comparison group, 66% of births were vaginal (unassisted), with 23% of women delivering their baby via caesarean section (9% elective and 14% emergency), and the remaining 12% having instrumental deliveries. Findings were thus similar within the comparison group.

Figure 14: Proportion of mothers by mode of birth delivery



Baby characteristics and health

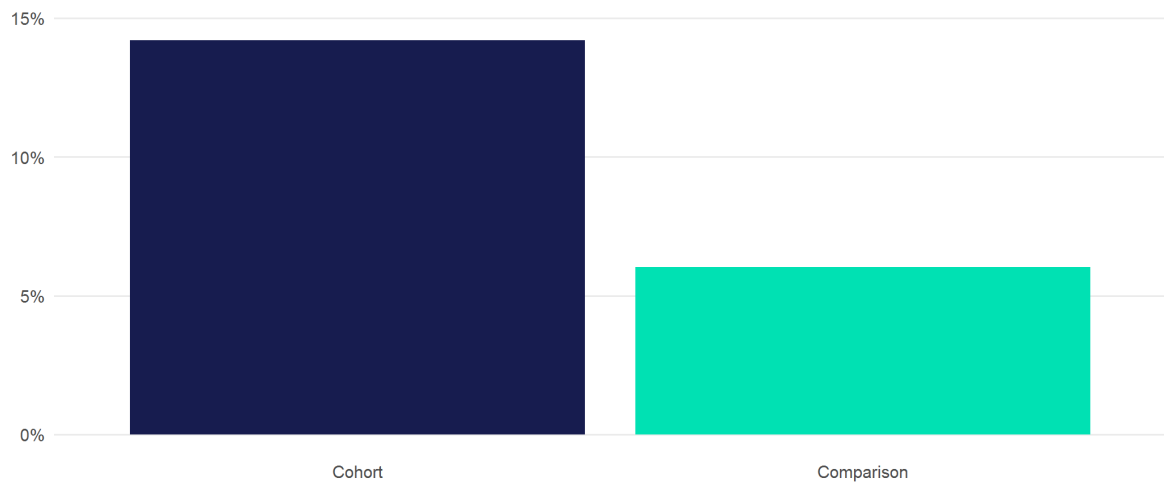
Gestational age at onset of labour

Figure 15 shows the distribution of gestational period at the onset of labour for mothers, captured in completed weeks. A greater proportion (14%) of our study cohort had a pre-term birth (before 37 weeks)—more than double the rate evident in our comparison group (6%) (Figure 16).

Figure 15: Gestational age at onset of labour



Figure 16: Comparison of proportions of babies born prematurely (<37 weeks gestation) between cohort and comparison groups



Birth weight

Around 85% of full-term babies (≥ 37 weeks) were born within the ‘healthy weight’ range (2,500g to 4,000g) in both the cohort and comparison groups. However, there was a greater proportion of full-term babies with a low birth weight (<2,500g) in the cohort (8%) than in the comparison group (2%) (Figure 17). This was offset by a larger proportion of babies born over 4000g in the comparison group (7% cohort, 13% comparison group).

Figure 17: Proportions of low and high birthweights for full-term births

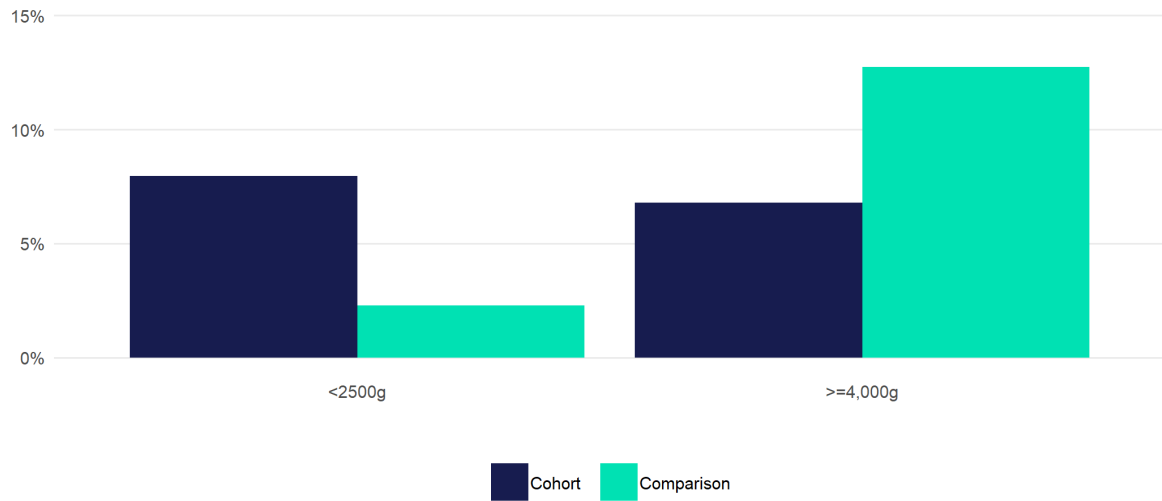
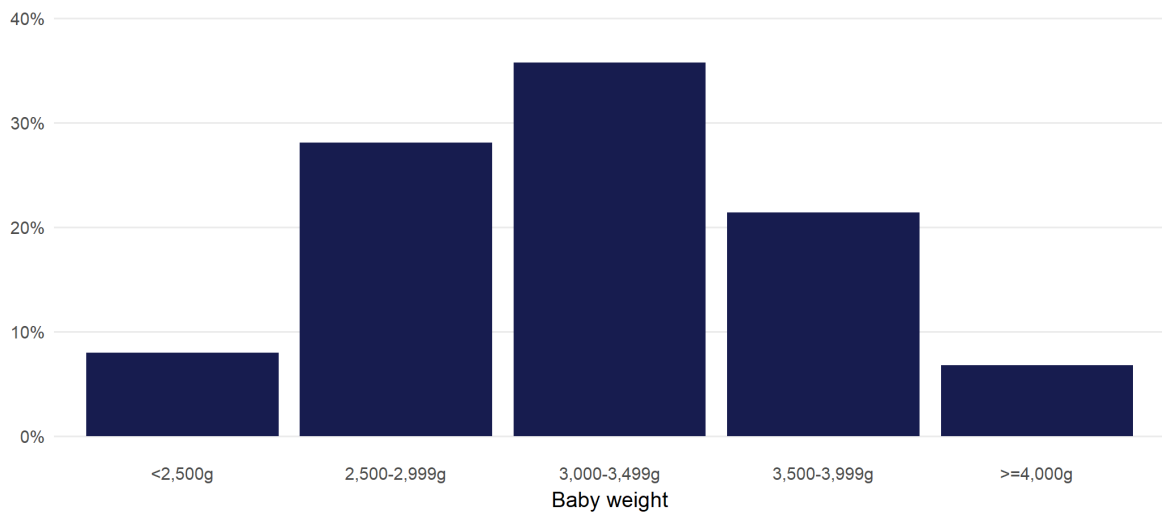


Figure 18 shows the distribution of baby birth weights for full-term births in the cohort.

Figure 18: Distribution of full-term birth weights



Apgar score

The majority (97%) of babies in the cohort had Apgar scores of 7 or over—a sign of a good physical condition at birth. This is very close to the results of the comparison group, which reported 99% of babies with Apgar scores of 7 or above at birth.

3. Recommendations

Maternal demographics, health and well-being

The overall picture regarding mothers' demographic profiles, as well as health and well-being, is of heightened levels of need and/or vulnerability along multiple dimensions, when compared to other pregnant women in the general population. Mothers in care proceedings were generally younger, more likely to be living in deprived areas of Wales, to have mental health and substance use problems, and to be smokers. Fewer intended to breastfeed their babies.

Published research indicates that some of the health vulnerabilities identified are likely to be present in the broader population of mothers living in conditions of socio-economic disadvantage (Fone et al. 2007; Goodwin et al. 2017; Peregrino et al. 2018; Riaz et al. 2018). Analysis based on a matched comparison group would further illuminate this point. However, given the multiple dimensions of health vulnerabilities—and in particular, very high rates of mental health needs—the following immediate actions are suggested.

- Local authorities in Wales are moving towards an earlier pre-birth response to all families referred to children's social care services. Establishing **a timely response to families who are referred, which is consistent across Wales**, in the first trimester of pregnancy, is critical. Many of the health needs with which mothers present are amenable to treatment and support, if pre-birth assessment and help comes early enough.
- Social work pre-birth assessment must be attuned to maternal mental health and broader well-being needs. Consultation with social workers around these findings is an important next step, to ascertain whether they feel able to identify and **respond to maternal mental health**, and to identify any professional training needs.
- Although some mothers may have had previous involvement with children's social care services, either in relation to previous children or because they themselves had been looked after during childhood, services also need to be responsive to the needs of mothers not already known to services, including first-time mothers.
- Further research analysis using diagnostic and prescribing data to **differentiate mental health conditions** is pressing, to build on this first exploratory linkage study; this may allow more bespoke support strategies to be developed depending on the types of mental health conditions reported and recorded.
- We were unable to make an assessment of the existence of specialist perinatal mental health care plans contained in the MIDS data due to high levels of missing data. Further investigations are required to understand the reasons for this. The recording of this type of information allows for audits of services and may help inform future policy and research. Initiatives to improve recording are required.
- Cessation programmes need to further understand barriers to stopping smoking during pregnancy (Bauld et al. 2017), which may be particularly difficult for women with mental health issues (Goodwin et al. 2017).

- Findings regarding deprivation need to feed into broader actions and strategies regarding the tackling of inequality in Wales, based on a growing body of robust evidence.

Maternal reproductive history and interaction with midwifery services

We have provided new statistics on how mothers of children involved in family court proceedings interact with maternity services. Findings firmly challenge any assumptions that the majority of mothers who become involved with children's services avoid or delay contact with antenatal services; in fact, a sizeable proportion of mothers appearing to interact with antenatal services at a timely point in pregnancy. The following immediate actions are suggested.

- The findings regarding both timely and late booking need **wide dissemination** to refute assumptions that in general women at risk of care proceedings avoid antenatal services.
- As above, this positive finding indicates that there is **clear opportunity for more intensive early engagement** with women at risk of becoming involved in care proceedings. The findings suggest this may be particularly important for mothers who have previously given birth more than once. It is critical that mothers seeking early engagement receive **a holistic response** from midwifery services at booking, including timely referral to early help services in pregnancy, and where appropriate to children's social care. Late booking could be tentatively linked to the concerns of avoidance of services, with those older/multiparous mothers more likely to have been involved with social services with previous children—but this can only be confirmed through further analysis.
- The findings raise questions about whether the pivotal role that midwives play in identifying women who may be at risk of care proceedings is sufficiently realised. This requires further consultation with health and social care professionals around the decision-making process when referring women to children's social care services and how this responds to women's needs.
- A smaller group of mothers require additional and targeted support or encouragement to ensure timely engagement with antenatal services. The research provides firm evidence that **the standard approach of universal antenatal services is not meeting the needs of a proportion of mothers**. Here, there may be a critical role for the Reflect service in Wales given that this service works with women who have had children removed previously, and offers an alternative approach to service engagement.⁶
- Further research is needed to **understand women's differentiated patterns of booking** and implications regarding outcomes of care proceedings for children.

⁶ For details see: Roberts, L., Maxwell, N., Messenger, R. and Palmer, C. (2018). *Evaluation of Reflect in Gwent: final report*. Cardiff: Cascade. Available at: <https://sites.cardiff.ac.uk/cascade/our-projects/reflect>

Immediate pregnancy and birth outcomes

Given the findings regarding mothers' heightened health and well-being difficulties, it is perhaps not surprising that a greater proportion of our cohort had pre-term births, and a higher proportion of babies had low birth weights; however, their Apgar scores indicated that babies were not less healthy. This is an interesting initial indicator of infant condition at birth, but further work will examine additional indicators of short-term and, importantly, longer-term health given evidence that history of mental health, and substance use during pregnancy, can increase risk of poorer child outcomes (Mamluk et al. 2017; Zhao, McCauley and Sheeran 2017). We recommend the following actions:

- future research should explore associations between maternal health and well-being, interaction with antenatal services and risk for premature births and low birth weight babies for mothers at risk of care proceedings
- insights should be obtained into the characteristics of child and maternal health soon after birth and in the longer term.

4. Conclusion

This report has started to build evidence about health and well-being in pregnancy, interaction with maternity services, and birth outcomes for mothers in care proceedings. This is, to our knowledge, the first time that population-level family court records and maternal health records have been linked, and our descriptive analyses pave the way for further research in this area. By linking records, we have demonstrated the ability to extend the insights reported in the two earlier reports in the Born into Care series, which were based on unlinked Cafcass administrative datasets (Broadhurst et al. 2018; Alrouh et al. 2019).

The findings we have reported highlights the vulnerability of these mothers and children, firmly underscoring the need for early intervention and enhanced support in the pre-birth period. Given that a sizeable proportion of birth mothers engage with antenatal services within the first trimester of pregnancy, this raises the question of what more might be done to identify vulnerable families, in order to offer preventative strategies. The prevalence of mental health needs is concerning, and firmly indicates the need for all health and social care professionals to be attuned to the mental health needs of women in pregnancy, and that mental health needs should feature more centrally in children's social care pre-birth assessment. Welsh policy and practice colleagues require a rich and differentiated picture of families involved in the family justice system in order to tailor services more closely to need and to make the best, evidence-informed decisions.

Consultations to discuss the report's findings with health and social care professionals will be ongoing.

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Appendices

A. Data sources

For each data source within the SAIL Databank, including records from Cafcass Cymru, personal identifiable data has been removed and replaced with a unique identifier, otherwise known as an anonymised linkage field (ALF) or residential anonymised linkage field (RALF) (Rodgers et al. 2009), for each person to enable linkage of records from different sources. SAIL anonymisation and linkage methodology is described elsewhere (Lyons et al. 2009). All data within the SAIL Databank are treated in accordance with the Data Protection Act 2018 and are compliant with the General Data Protection Regulation.

Cafcass Cymru

The primary source of family justice data was electronic case management data routinely produced by Cafcass Cymru, which was securely transferred to and anonymised within the SAIL Databank. Further details about Cafcass Cymru and Cafcass England data, and the Family Justice Data Partnership are available elsewhere (Johnson et al. 2020; Bedston et al. 2020).

All instances of s.31 care proceedings initiated between 1 January 2011 and 31 December 2018 were included in this study. Electronic data of sufficient quality for public law research is not available before 2011. Relevant case information included: child's week of birth and sex; adult respondent's week of birth, sex, and indication of relationship to the child; and the date on which the respective local authority submitted the s.31 application.

For the purpose of this study, the Cafcass Cymru data was linked to other data sources within the SAIL Databank using ALFs, including the following.

Welsh Demographic Service Dataset (WDS)

The Welsh Demographic Service Dataset (WDS) provides demographic characteristics of people registered with general practices in Wales—providing residents' demographic and address details (RALFs) including lower layer super output area (LSOA 2011 version), which can be linked to obtain measures of deprivation.

Welsh Index of Multiple Deprivation (WIMD)

The Welsh Index of Multiple Deprivation (WIMD) is the Welsh government's official deprivation measure for small areas in Wales. Each LSOA, which in 2011 in Wales and England contained an average population of 1,614 (ONS, 2012) is ranked from 1 (most deprived) to 1,909 (least deprived), then divided into five equal parts to obtain deprivation quintiles.

Maternity Indicators Dataset (MIDS)

The Maternity Indicator Dataset (MIDS) captures data from local health board systems relating to women at their initial antenatal assessment, known as 'booking', and to mother

and baby (or babies) at labour and birth. A health and social care needs assessment is undertaken at booking, and the antenatal sections of the maternity hand held record are completed at this time. The data is organised into two data tables: 'MIDS initial assessment' relating to the initial assessment, and 'MIDS births' containing data items relating to the labour and birth. Maternal demographic data, such as age and LSOA, is also contained in the MIDS data.

MIDS was established to enable the Welsh government to monitor its initial set of outcome indicators and performance measures (maternity indicators), which were established to measure the effectiveness and quality of Welsh maternity services. The data was initiated to bring together the National Community Child Health Database and the Maternity Indicators dataset. Whilst this combined data was established in 2016, data from April 2014 for 'initial antenatal assessment' events, and from April 2015 for birth events, were collected retrospectively by the NHS Wales Informatics Service (NWIS). The data used in this study was restricted to dates where a child's date of birth was between 1 January 2015 and 31 December 2018.

For further quality information, including a description of the main strengths and limitations of MIDS please see the 'Maternity and births in Wales: Quality report' (Welsh Government, 2019d), and recent statistics published by the Welsh government (Welsh Government, 2019e). More information on the data items collected is also available through the NWIS Data Dictionary.⁷

Patient Episode Database for Wales (PEDW)

The Patient Episode Database for Wales (PEDW) contains data for all episodes of inpatient and day-case activity in NHS Wales hospitals, including elective and emergency admissions, minor and major operations, and hospital stays for childbirth.⁸ Key data variables used in this study include admission dates and ICD-10 diagnosis codes for each episode of care, relating to the reason for admission and co-morbidities for each patient.⁹ The data for this study was restricted to admission dates from 2000 to 2018 inclusive.

Welsh Longitudinal General Practice data (WLGP)

The Welsh Longitudinal General Practice (WLGP) data contains GP records for patients registered with a Welsh GP, for the approximately 80% of practices that supply data to the SAIL Databank. Each record within the data source contains key information such as the event date and 'Read codes' which are used by GPs to record patient findings and

⁷ <http://www.datadictionary.wales.nhs.uk/#!/WordDocuments/datasetstructure20.htm>

⁸ <http://www.publichealthwalesobservatory.wales.nhs.uk/pedw/>

⁹ International Statistical Classification of Diseases and Related Health Problems 10th Revision
<http://apps.who.int/classifications/icd10/browse/2016/en>

procedures.¹⁰ For this study, the event date coverage was restricted from 2000 to 2018 inclusive.

The WLGP and PEDW data sources described above were used solely for the classification of substance use (alcohol and drug) and mental health-related contacts or admissions.

B: Cohort and general population comparison group selection process

The mothers included in this study were birth mothers of all infants involved in s.31 care proceedings in Wales between 2011 and 2018 inclusive, who could be linked to their antenatal and health records. They are a subset of the mothers (n=3,266) included in our earlier 'Born into care: Newborns and infants in care proceedings in Wales' report (Alrouh et al. 2019).

A series of data preparation steps were taken to create the cohort for this study. Decisions taken in the cohort selection and this exploratory study design were made for pragmatic reasons, and were also shaped by the availability of MIDS, which, at the time of analysis, had data from the end of 2014 to early 2019. Future analyses may choose to modify the study design and cohort selection to increase cohort size.

Cohort

We included all mothers with records in both 'MIDS assessment' and 'MIDS births' datasets where the initial assessment date was within eight months of infant birth date to ensure records related to the same birth across both MIDS datasets were retained, and the birth date was between 1 January 2015 and 31 December 2018. Only birth records relating to the birth of a child recorded as having been involved in care proceedings as included in the 'Born into care: Newborns and infants in care proceedings in Wales' report' cohort of infant records were included. We restricted the selection to singleton births, where mothers were aged between 12 and 59 at birth, and to Welsh LSOA codes. We then restricted selection to the earliest recorded birth.

The cohort consisted of a total of 1,111 mothers (Figure B.1).

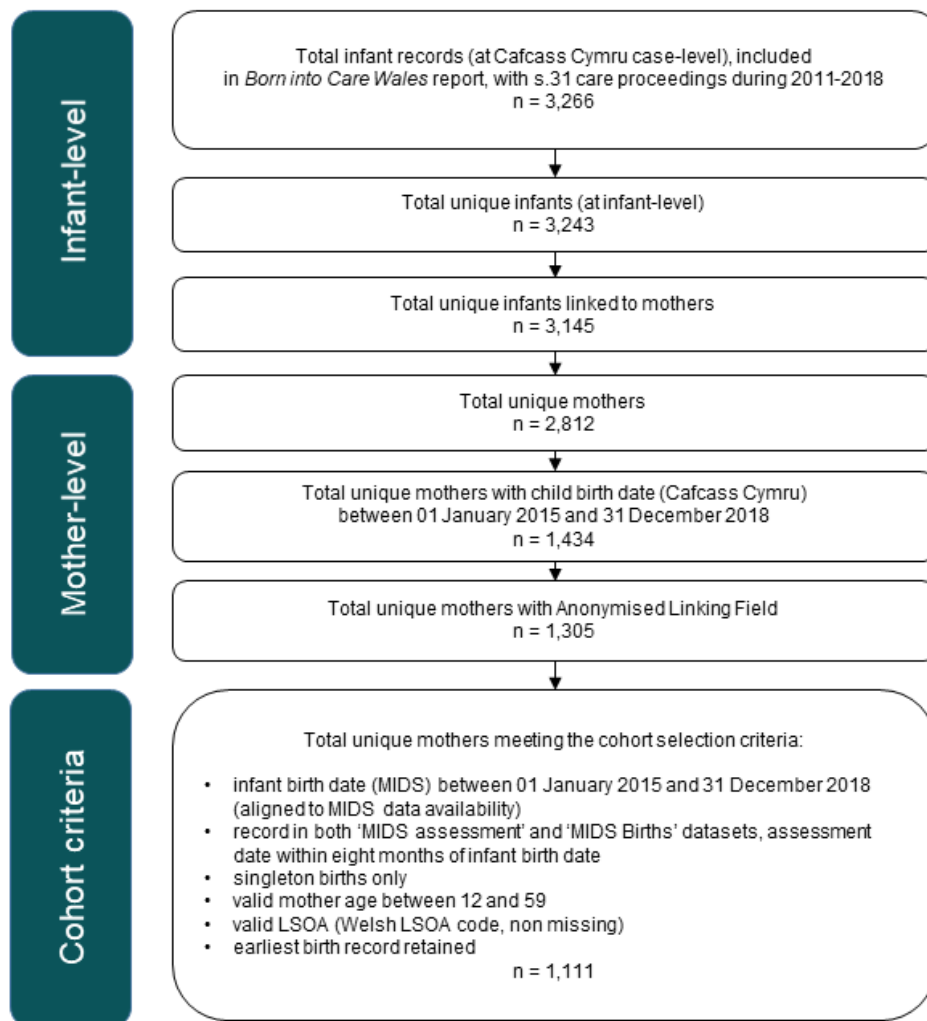
Comparison group

The comparison group was selected according to the same method as the cohort, except that the mothers were not linked to records included in the 'Born into care: Newborns and infants in care proceedings in Wales' cohort of infants.

The comparison group consisted of a total of 97,191 mothers.

¹⁰https://www.datadictionary.nhs.uk/web_site_content/supporting_information/clinical_coding/read_coded_clinical_terms.asp?shownav=1

Figure B.1 Flow diagram of study participants



C: Measures

The table below provides details on each measure used within the analyses, including definitions, data sources, and any data transformations.

C.1: Measures

	Data item	Data source(s)	Data item term
Maternal demographic characteristics, health and well-being			
Demographic characteristics	Age	Cafcass Cymru, MIDS, WDSD, WIMD, PEDW	<p>Age: two measures of age were used. The first measure details mother's age at birth for the child involved in court proceedings in this study. The second is maternal age at entry to motherhood, using the earliest record of childbirth, regardless of whether the child was involved in court proceedings.</p> <ul style="list-style-type: none"> • Age at current birth: calculated at the birth of the child relating to current court proceedings. Categorised into age bands: <21, 21-25, 26-30, 31-35, and >35. • Age at entry to motherhood: calculated at the date of a woman's earliest birth record. This measure acts as a proxy for age at entry to motherhood based on hospital inpatient records (PEDW).¹¹ Categorised into age bands: <21, 21-25, 26-30, 31-35, and >35
	Deprivation at childbirth	Cafcass Cymru, MIDS, WIMD	Measured using the income deprivation domain of WIMD (version 2014) grouped into quintiles (1 - most deprived, to 5 - least deprived).

¹¹ Age at earliest childbirth calculated at the earliest date that a mother has a hospital admission where the main reason for attendance was related to childbirth. Specifically, any admission recorded as chapter 15 of ICD-10 classifications: 'Pregnancy, childbirth and the puerperium'.

Measures of maternal mental health and well-being	Mental health conditions (self-reported)¹²	MIDS initial assessment	Self-report of one or more of the following: puerperal psychosis (severe postnatal depression); bi-polar affective disorder/manic depression; psychosis; psychotic depression; schizophrenia; and other.
	Mental health care plan	MIDS initial assessment	To establish whether the woman has had a mental health care plan put in place within four weeks of the initial assessment. The MIDS dataset held in SAIL does not contain a sufficient level of detail to differentiate between the conditions noted.
	Mental health related contacts and admissions¹³	PEDW and WLGP ¹⁴	Mothers' health records were analysed for the presence of clinical codes indicating mental health-related contacts or admissions. If a mother had one or more mental health (MH)-related contact or admission code recorded at any date prior to the birth of the child related to the care proceedings in primary care (WLGP) or hospital (PEDW) data, the mother was categorised as 'MH, or 'No MH'. Code lists were developed and provided by the Adolescent Mental Health Data Platform and include codes for depression, anxiety and severe mental illness as well as eating disorders, attention deficit hyperactivity disorder, autistic spectrum disorder, conduct disorder and developmental disorders. ¹⁵

¹² The MIDS dataset currently held in SAIL does not contain a sufficient level of detail to differentiate between the mental health conditions noted. SAIL does however contain data that will allow further analyses into the type of mental health conditions to be explored.

¹³ It is important to note that to define mental health or substance use contacts and admissions we searched specific clinical codes at any date prior to the child's birth. This method results in an 'unbalanced dataset' where not every person had health data recorded for the same period prior to a birth, for instance a 35-year old mother will have far more potential to have health issues and therefore data, than an 18-year old mother. Future, more detailed studies would aim to employ stricter rules to derive measures which could be, for example, designed to understand the proportion of mothers who have specific health records within a set time prior to child birth.

¹⁴ As SAIL contains data for ~80% of GP practices in Wales any proportion calculations should adjust for the lower denominator (i.e. total number of mothers who it would be expected have WLGP data in SAIL). In this exploratory study this adjustment has not been made, further, more detailed studies should aim to include this in the methodology. We do not expect this to have a material effect on the results provided.

¹⁵ <https://adolescentmentalhealth.uk>

	Substance use-related contacts and admissions (SU)	PEDW and WLGP	Health records were analysed for clinical codes indicating substance use indicative of problem, harmful or hazardous use of alcohol and/ or illicit drugs. If a mother had any such code at any date prior to the birth of the child involved in the care proceedings they were classified as having 'experience of substance use', or 'no experience of substance use'. Code lists were developed with advice from clinicians including a substance use disorder nurse and provided by the Adolescent Mental Health Data Platform.
	Body mass index (BMI)	MIDS initial assessment	For mothers with valid weight (30 kg to 250 kg) and height (120–200 cm) records, we calculated the BMI (kg/m ²); then categorised into standard BMI classifications: underweight, <18.5; healthy weight, 18.5–24.9; overweight, 25–29.9, obese, 30–39.9, or morbidly obese ≥ 40).
	Smoking status during pregnancy and at birth	MIDS initial assessment and births	Categorised into: smoker or non-smoker (regardless of reporting type, self-reported or carbon monoxide validated).
	Intention to breastfeed	MIDS initial assessment	Breastfeeding is captured in MIDS as intention to breastfeed the baby at birth, rather than actual breastfeeding initiation (when a mother begins to feed her infant milk from her breast).

Maternal reproductive history and interaction with midwifery services			
Reproductive history	Pregnancies	MIDS initial assessment	Gravida. The total number of pregnancies for a woman (including current pregnancy), regardless of whether pregnancy carried to term. Four categories: 1, 2, 3 or >3.
	Previous live births	MIDS initial assessment	Parity. Number of times a woman has given birth to a live neonate (any gestation) or at 24 weeks or more, regardless of whether the child was viable or non-viable (i.e. still births). Note, as this data was collected at initial assessment, this measure relates to previous live births and does not include birth of current child involved in care proceedings. Three categories: never previously given birth; previously given birth only once; and previously given birth more than once.
Interaction with midwifery services	Gestational age at initial booking	MIDS initial assessment	Gestational age in weeks.
Immediate pregnancy and birth outcomes			
Labour and birth	Place of birth	MIDS births	Hospital or non-hospital birth
	Mode of birth	MIDS births	Vaginal (unassisted), instrumental (ventouse or forceps delivery), caesarean section (elective or emergency).

Baby health	Gestational age at onset of labour	MIDS births	Gestational age in weeks. Categories: premature <37 weeks; full-term babies (≥ 37 weeks)
	Birth weight (g)	MIDS births	Recorded in grams. Categories: <2,500g (low birthweight); 2,500-2,999g; 3,000-3,499; 3,500-3,999g; ≥4,000g
	Apgar score	MIDS births	A newborn test involving numerous health checks (baby's colour, heart rate, reflexes, muscle tone, and respiration) each of which is scored 0, 1, or 2. The test assesses if extra medical care or emergency care is needed—identified if the total score for infants is less than 7. The test score available in MIDS is the five-minute, summed Apgar score (range 0–10). Categories: <7, or ≥7 or more.

In terms of measures created within SAIL for substance use and mental health

- For hospital inpatient data (PEDW) we searched for any diagnostic codes (up to 14 for each episode of care); this includes codes indicative of the main admission reason, or any listed co-morbidities of the patient, deemed relevant at the time by the consultant.
- For GP data (WLGP), a patient can have multiple entries for each interaction with a GP; we searched all records to find any codes relevant to mental health or substance use.

We searched for specific clinical codes within GP and hospital data at any date prior to the child's birth. As such, this window of opportunity will have been longer for older mothers – future studies will employ stricter rules to derive measures which could be, for example, designed to understand the proportion of mothers who have specific health records within a set time prior to child birth – such as during pregnancy.

D: Analytical process

The analysis was designed to be descriptive. We calculated the proportions of mothers or babies with characteristics of interest during pregnancy, at birth or - in the case of mental health and substance use - at any point prior to the birth of the child involved in family court proceedings. Where appropriate the characteristics were compared across deprivation quintiles. Data processing and analysis was carried out using SQL, Excel and R.

E: Information governance approval and statistical disclosure control

The project proposal was reviewed by the SAIL Information Governance Review Panel (IGRP) at Swansea University. This panel ensures that work complies with information governance principles and represents an appropriate use of data in the public interest. The IGRP includes representatives of professional and regulatory bodies, data providers and the general public. Approval for the project was granted by the IGRP under SAIL project 0929. Cafcass Cymru (the data owner of the family courts data) also approved use of the data for this project. The agency considered the public interest value of the study, benefits to the agency itself, as well as general standards for safe use of administrative data.

SAIL has strict statistical disclosure processes and policies to prevent potential disclosure of any individual. This includes suppressing of information in tables where the number in any individual cell is less than five, or where geographical identifiers might disclose the identity of the individual concerned either alone or in combination with other data. Where this has been employed, it is noted within the relevant sections. For example, age bands have been expanded in certain analyses to prevent disclosure problems related to small numbers.