**Title: Health inequalities in timely antenatal care: audit of pre- and post-referral delays in antenatal bookings in London 2015-16**

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**Abstract**

Background

Antenatal booking has potential to reduce infant and maternal health inequalities, yet those most in need are least likely to access timely care. This audit describes late referral and antenatal booking across London in 2015-16, according to maternal characteristics.

Methods

Referral <8 weeks gestation, booking <2 weeks after referral, and booking <10 weeks gestation were audited against maternal and referral characteristics.

Results

Of 122,275 antenatal bookings, 27.1% were before 10 weeks gestation and 72.8% by 12+6 weeks. Characteristics associated with late booking were: living in more deprived areas, age <20 years, higher parity, Black or Minority ethnicity (particularly Bangladeshi or Black African), birth in Somalia, Jewish religion, first language other than English, unemployment of self or partner, lack of social support, or single parent families. Women living in more deprived areas, with first language other than English, of Jewish religion, Black and Minority ethnicity, or who were unemployed, waited longer from referral to booking, despite later referral.

Conclusions

Post-referral delays can compound late referral for some women, exacerbating health inequalities, but should be amenable to provider interventions. Different patterns of pre- and post-referral delay suggest that a tailored approach is needed to address inequalities in access to antenatal care.

**Background**

Antenatal booking appointments offer a holistic assessment of a woman’s health, emotional and social needs at the start of her pregnancy. Timing is important. Early booking enables minimisation of risk during pregnancy through early health promotion, health and social service referrals, and antenatal screening in time for decision-making. NICE guidance recommends that antenatal booking should take place by 10+0 weeks gestation.(1)

Giving every child the best start in life is crucial to reducing health inequalities, starting before birth.(2) Late booking or missing antenatal appointments are associated both with poorer pregnancy outcomes and markers of social disadvantage.(3, 4) Timely antenatal care may reduce health inequalities, through reducing smoking in pregnancy; facilitating access to health and social services;(5) and antenatal screening for diseases such as sickle cell disease.(6)

A previous health equity audit of 93,000 deliveries in London in 2013-14 found inequalities in timely access to antenatal care in London (personal communication, Scarlett).(7) In response, the London Maternity Clinical Network has worked to promote early referral and antenatal booking across London.(8) Actions have included promoting a target of booking by 10+0 weeks with GPs and commissioners, developing a standard online referral form, improving the ease of self-referral, and sharing good practice across the network.

This health equity audit aimed to identify how many antenatal bookings were taking place by 10 weeks gestation in London 2015-16, describe characteristics which identified women at higher risk of later booking, and investigate the pattern of delays pre- and post-referral.

**Methods**

Data

All maternity service providers in the London region were requested to report all antenatal bookings between 1 April 2015 – 31 March 2016, using a standard template. Data fields included antenatal booking appointment date, expected delivery date and last menstrual period, demographics (date of birth/age at booking, postcode of residence, ethnicity, country of birth, first language spoken, religion), previous livebirths and stillbirths, disability, social factors (employment status, smoking status, substance misuse, complex social needs), family context (presence of support from family or friends, one-parent or two-parent family, partner’s employment), and referral details (date and source of referral). Data fields were requested in the same format as regional reporting standards to maximise data availability and consistency.

The dataset was pseudonymised and cleaned to remove invalid entries and standardise data categorisation. Gestation at booking was calculated using expected delivery date unless missing or invalid (producing a gestation at booking <0 or >43 weeks gestation), in which case last menstrual period was used. Bookings without an eligible booking date and valid gestation at booking were excluded. Area deprivation was defined by Lower Super Output Area (mapped from London postcodes of residence) using the regional (London) quintile of the Index of Multiple Deprivation.

For all variables, missing data were categorised as either: missing because the service provider could not report this variable for any bookings (“Trust not reported”); or missing because the individual booking had a missing or invalid record (“missing”).

Analysis

The primary outcome was a booking appointment by 10 weeks’ gestation. A pre-specified subanalysis of bookings with referral date available considered two separate outcomes: referral by 8 weeks’ gestation, and booking within 2 weeks of referral. All maternal, social and referral factors were treated as categorical variables, and the least deprived or largest categories selected as reference groups. The univariable association of each maternal and social factor with each outcome was described using odds ratios and chi-squared tests. The categories “Trust not reported” and “missing”, and any categories with an expected or actual value <5, were excluded from statistical tests. This was a descriptive service audit and multivariable analysis was not conducted. All data cleaning and analysis were conducted using Microsoft Excel.

Service provider input

Results were presented to service providers at performance and quality meetings and at the regional Heads of Midwifery meeting. Feedback and discussion were invited to interpret the results in the experience of service providers.

Ethics

This was an audit for the purpose of service evaluation, and therefore research ethics committee approval was not sought.

**Results**

Data were available for 124,861 antenatal bookings in London from 1 April 2015 to 31 March 2016, from 20 service providers (three providers did not submit data). Gestation at booking could not be calculated for 2,586 records, which were excluded. The remaining 122,275 bookings were included in the audit (97.9%).

Availability of data fields varied by service provider, and data completeness within reported fields also varied (**Table I**). Ethnicity and age at booking were the only maternal factors which all providers were able to report consistently. Referral date was reported by 12/20 service providers accounting for 73,015 bookings (59.7%), of which 70,947 (97.2%) had a valid referral date. Bookings at service providers not reporting referral dates were less likely to be after 10 weeks gestation than bookings for which referral date was reported (67.9% vs 76.1%, OR 0.66 [95%CI 0.64–0.68]). Data completeness for maternal factors ranged from 28.5% for single parent family status, to >99.9% for age at booking. Data were available for fewer than 40% of bookings for religion (32.6%), country of birth (35.8%) and single parent family status (28.5%).

Indicators of complex or social needs were identified in a high proportion of bookings (**Table I**). These included a first language other than English for 25.7% (21,919/85,255), complex social needs for 13.5% (10,618/78,419), current smoking for 6.0% (5,874/97,859) and current substance misuse in 0.4% (378/85,391), each as a percentage of bookings at service providers reporting the relevant data.

Of the 122,275 bookings included in the audit, 27.1% were before 10 weeks gestation, 45.7% between 10-12 weeks, 17.3% at 13-21 weeks and 9.9% ≥22 weeks gestation. 43% of referrals were received by 8 weeks gestation and 31% were booked within 2 weeks of referral. The median time from referral to booking was 18.6 days (interquartile range 11.5–28.0).

Maternal factors associated with late antenatal bookings

Bookings were more likely to be after 10 weeks gestation for women: living in more deprived areas, aged <20 or ≥40 years, higher parity, black or minority ethnicity (particularly Bangladeshi or Black African ethnicity), born in Somalia, of Jewish religion, speaking a first language other than English, not employed (particularly long term sick/disabled), with a partner not employed, lacking support from family and friends, or in single parent families **(Table I)**. Bookings were less likely to be ≥10 weeks gestation for women with a history of stillbirth, born in India, and ex-smokers, compared to women without a history of stillbirth, women born in the UK and never-smokers, respectively.

Late referral and/or post-referral delay contributing to late bookings

Women were more likely to be referred late (>8 weeks gestation) if they were: aged < 20 years old; of Black African ethnicity; born in Sri Lanka; high parity; long-term sick or disabled; lacking support from family or friends; with complex social needs; or in single parent families (**Table II**).

Women were more likely to wait over two weeks from referral to booking if they were: living in the most deprived quintile of areas; born in Somalia; or of Jewish or Sikh religion (**Table II**). Women who lived in the most deprived quintile of areas waited on average ten days longer from referral to booking than those living in the least deprived quintile (**Figure 1**).

Overall, referrals at a later gestation had a shorter wait to booking. Among maternal factors associated with later referral, some were mitigated by a shorter time from referral to booking: being born in Sri Lanka, disability identified in medical notes, current smoking and complex social needs were all associated with later referral but not later booking.

However, longer waits from referral to booking compounded late referrals for women: speaking a first language other than English, of Jewish religion, unemployed, or of most Black or Minority ethnicities (White Irish, Other White, Black African, Black Caribbean, Other Black, Bangladeshi, Pakistani, Other Asian, White and Black African, Other Mixed, Chinese or Other ethnicity compared to White British).

Some maternal risk factors for late booking were associated with longer waits from referral to booking, but not late referral. These included living in more deprived areas, being born in Somalia, Bangladesh, Ghana, Nigeria, Poland or Romania, and Muslim religion.

Feedback from service providers

Service providers noted that the shorter time to booking for women referred later or with identified health or social needs was the result of positive prioritisation of high-risk referrals. They identified that better quality referrals could improve the ability to prioritise disadvantaged groups, and reduce delays from arranging interpretation.

Variation in service capacity may be an important driver of health inequalities in antenatal care access. This may be subtle: services with a high prevalence of bookings by women with complex needs may need extra capacity to offer longer appointments; services with little reserve capacity may struggle to offer swift reappointments or follow up missed appointments; long waits for supporting services such as phlebotomy may deter women attending.

Some priorities conflicted with early booking. These included the drive to prioritise referrals just in time to meet the 13-week historical target, and “one-stop shop” antenatal appointments incorporating a nuchal ultrasound scan, which can only be performed from 11+0 weeks gestation.

**Discussion**

Main findings of this study

Of 122,275 bookings recorded in London in 2015-16, 27.1% were before 10 weeks gestation, and 72.8% by 12+6 weeks. 43% of referrals were received by 8 weeks gestation and 31% were booked within 2 weeks of referral. There was a high burden of health and social need.

This audit finds evidence of persistent inequalities in access to timely antenatal care across London, with different groups at risk of late referral, longer wait after referral, or both. Characteristics most strongly associated with late booking were: living in more deprived areas, age <20 years, higher parity, Black or Minority ethnicity (particularly Bangladeshi or Black African), birth in Somalia, Jewish religion, unemployment of self or partner, and lack of social support. Many of these characteristics are also known to be associated with social disadvantage, poorer pregnancy outcomes and poorer infant health.

The large inequalities in waiting time between referral and booking may be amenable to interventions by service providers and commissioners. Women living in the most deprived areas waited on average twice as long from referral to booking as women in the least deprived areas, a difference of ten days.

For women speaking a first language other than English, Jewish religion, maternal unemployment, and most Black or Minority ethnicities, later referral is compounded by a longer wait to booking, and reducing inequalities for these women will be a priority.

What is already known on this topic

Our findings are consistent with previous UK studies which have found that deprivation, age under 20 years, higher parity, a lack of social support, living alone, unemployment, Black and Minority ethnicity, not speaking English and being born outside the UK are associated with later booking.(9-15) Service factors such as hospital type have also been associated with later booking in other high-income countries.(14)

Despite concerted regional and local actions, this audit revealed very similar results to a previous London antenatal booking audit in 2013-14, which reported that 75.2% of women booked in by <13 weeks gestation, and women were more likely to book late if they were younger, of Black African ethnicity, of Jewish religion, higher parity or living in more deprived areas (personal communication, Scarlett).(7)

The mechanisms behind these associations are not fully understood. A study in Newham found that Black African or Caribbean ethnicity was associated with later access to antenatal care even when restricted to women born in the UK and speaking English, suggesting that this association is driven by more complex socio-cultural factors than language barriers or assimilation of migrants.(10) The practical, psychosocial and cultural influences of maternal characteristics on health-seeking behaviour may include factors specific to antenatal care such as the woman’s feelings about her pregnancy.(11) In addition, service factors (such as whether referral pathways require high literacy or English language, convenience and availability of appointments) are likely to play a role. For example, women living in more deprived areas in England are less likely to report that that they have been treated respectfully or spoken to in a way they understand by healthcare workers.(15) Factors such as area deprivation, unemployment and lower income may operate on a community or contextual level, as well as at an individual level, and inequalities may represent the effect of living in “distressed neighbourhoods”.(14)

What this study adds

This audit collected a large (and almost comprehensive) dataset of bookings in London in 2015-16, covering a wide range of maternal, social and service characteristics, offering new insights into the different facets of inequalities in antenatal booking in real practice across a region. The audit provides novel evidence of inequalities in antenatal booking according to religion, disability, presence of complex social needs, and presence of support from family or friends, and individual countries of birth were distinguished rather than considering all non-UK born women as a single group.

To our knowledge, this is the first study to distinguish the contribution of pre-referral and post-referral delays to inequalities in accessing timely antenatal care. We found that the contribution of late referral and delays between referral and booking varied for different maternal and social factors, and in some cases post-referral delays compounded late referrals. This suggests that a tailored approach is required to address late booking depending on whether delays are pre- or post-referral, or both. The differential delays observed between referral and booking may be more amenable to service provider and commissioner interventions than late referral, and offer an opportunity to reduce health inequalities in access to antenatal care.

The different patterns of delay pre- and post-referral suggest that the causes and mechanisms of delay in access to timely antenatal care are likely to be specific to particular maternal and social characteristics. Feedback from providers highlighted that local service capacity and conflicting priorities are relevant to delivering timely antenatal care, and that triage can successfully prioritise referrals for certain groups given high-quality referrals. An individual, locally-based approach needs to be taken to addressing barriers to antenatal care based on the prevalence of local maternal characteristics, local sociocultural factors, and their interaction with local service design and delivery. The differential delays observed between referral and booking may be more amenable to service provider and commissioner interventions than late referral, and offer an opportunity to reduce health inequalities in access to antenatal care.

Limitations of this study

The main findings are consistent with previous research and internally consistent, suggesting a reasonable level of robustness. However, this is a descriptive audit using routinely collected service data, with limitations.

Several characteristics have a high proportion of missing data, notably religion, country of birth and single parent family status. The true prevalence of these factors may be higher or lower than observed, and if gestation at booking differs systematically with data completeness, estimates of the associations between each characteristic and gestation at booking may be biased upwards or downwards. Estimates of the associations of characteristics with low levels of missing data (such as age, area of deprivation and ethnicity) may be treated with less caution.

Each maternal characteristic is vulnerable to errors in measurement or recording. If gestation at booking differs systematically with misclassification, this could introduce information bias with over- or under-estimation of the associations between each characteristic and gestation at booking. This is a greater risk for characteristics which are more vulnerable to misclassification (such as support from family or friends) than for those which are more objectively measured (such as parity).

Odds ratios are unadjusted estimates from univariable analysis. Many of the maternal and social characteristics will coincide among individual women and cluster at a population level. If interpreted as estimates of the causal effect of an individual characteristic on antenatal care access, these estimates would be confounded by co-existing maternal and social characteristics. Univariable analysis was selected for the purposes of the audit as estimates describe the full inequality in access experienced by the population of women with each characteristic, reflecting the multi-faceted nature of health inequalities.

The analysis of delays pre-and post-referral was limited to the subset of bookings with a referral date. Referral date availability was largely determined by service provider data systems and the factors identified in this analysis were consistent with the overall analysis of late booking, suggesting that potential for selection bias was minimal.

Caution would be needed in generalising these results to other areas without better understanding of the mechanisms, and role of community-level factors and health service characteristics.

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**Conflict of interest**

The authors report no conflicts of interest for this work.

**References**

1. National Institute for Health and Care Excellence (NICE). Antenatal care for uncomplicated pregnancies 2008. Available from: <https://www.nice.org.uk/guidance/cg62>.

2. Marmot M, Allen J, Goldblatt P, Boyce T, McNeish D, Grady M, et al. Fair society, healthy lives: the Marmot Review. London: The Marmot Review; 2010.

3. Hollowell J, Oakley L, Kurinczuk JJ, Brocklehurst P, Gray R. The effectiveness of antenatal care programmes to reduce infant mortality and preterm birth in socially disadvantaged and vulnerable women in high-income countries: a systematic review. BMC Pregnancy Childbirth. 2011;11:13.

4. Kupek E, Petrou S, Vause S, Maresh M. Clinical, provider and sociodemographic predictors of late initiation of antenatal care in England and Wales. BJOG : an international journal of obstetrics and gynaecology. 2002;109(3):265-73.

5. National Institute for Health and Care Excellence (NICE). Pregnancy and complex social factors: a model for service provision for pregnant women with complex social factors2010 21 August 2018; NICE Clinical Guideline 110. Available from: <https://www.nice.org.uk/guidance/cg110>.

6. Aspinall PJ, Dyson SM, Anionwu EN. The feasibility of using ethnicity as a primary tool for antenatal selective screening for sickle cell disorders: pointers from the research evidence. Soc Sci Med. 2003;56(2):285-97.

7. Scarlett J. Results of NHS England health equity audit of booking for antenatal care in London in 2013-14 by Neil Smith (2015). 2016.

8. London Maternity Clinical Network. Improving early access to maternity services in London: a best practice toolkit. London Clinical Networks 2015 [Available from: <http://www.londonscn.nhs.uk/networks/maternity-childrens/maternity/>.

9. Baker EC, Rajasingam D. Using Trust databases to identify predictors of late booking for antenatal care within the UK. Public Health. 2012;126(2):112-6.

10. Cresswell JA, Yu G, Hatherall B, Morris J, Jamal F, Harden A, et al. Predictors of the timing of initiation of antenatal care in an ethnically diverse urban cohort in the UK. BMC Pregnancy Childbirth. 2013;13:103.

11. Kapaya H, Mercer E, Boffey F, Jones G, Mitchell C, Anumba D. Deprivation and poor psychosocial support are key determinants of late antenatal presentation and poor fetal outcomes--a combined retrospective and prospective study. BMC Pregnancy Childbirth. 2015;15:309.

12. Rowe RE, Magee H, Quigley MA, Heron P, Askham J, Brocklehurst P. Social and ethnic differences in attendance for antenatal care in England. Public Health. 2008;122(12):1363-72.

13. Rowe RE, Garcia J. Social class, ethnicity and attendance for antenatal care in the United Kingdom: a systematic review. J Public Health Med. 2003;25(2):113-9.

14. Feijen-de Jong EI, Jansen DE, Baarveld F, van der Schans CP, Schellevis FG, Reijneveld SA. Determinants of late and/or inadequate use of prenatal healthcare in high-income countries: a systematic review. Eur J Public Health. 2012;22(6):904-13.

15. Lindquist A, Kurinczuk JJ, Redshaw M, Knight M. Experiences, utilisation and outcomes of maternity care in England among women from different socio-economic groups: findings from the 2010 National Maternity Survey. BJOG : an international journal of obstetrics and gynaecology. 2015;122(12):1610-7.

**Figure Legends**

**Figure 1: Difference in average time from referral to booking by area-level deprivation (n=70,947)**



**Tables**

**Table I: Description of bookings and univariable associations of maternal and social characteristics with booking ≥10 weeks gestation (n=122,275)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Total bookings** | **Booking ≥10 weeks gestation** | **Odds ratio for booking ≥10 weeks (95% CI)** | **P value** a |
| **n** | **col %** | **n** | **row %** |
| **Deprivation (London Index of Multiple Deprivation quintile)** |
|  | 5 (most deprived) | 25,178 | 20.6 | 19,275 | 76.6 | 1.58 (1.51 – 1.65) | <0.001 |
|  | 4 | 25,816 | 21.1 | 19,685 | 76.3 | 1.55 (1.49 – 1.62) |
|  | 3 | 25,218 | 20.6 | 18,259 | 72.4 | 1.27 (1.22 – 1.33) |
|  | 2 | 16,089 | 13.2 | 11,349 | 70.5 | 1.16 (1.10 – 1.22) |
|  | 1 (least deprived) | 15,159 | 12.4 | 10,215 | 67.4 | 1 (reference) |
|  | Missing | 875 | 0.7 | 692 | 79.1 | 1.83 (1.55 – 2.16) |  |
|  | Trust not reported | 13,940 | 11.4 | 9,645 | 69.2 | 1.09 (1.03 – 1.14) |  |
| **Age (years)** |
|  | <20 | 2,840 | 2.3 | 2,246 | 79.1 | 1.50 (1.37 – 1.64) | <0.001 |
|  | 20-24 | 14,698 | 12.0 | 11,069 | 75.3 | 1.21 (1.16 – 1.26) |
|  | 25-29 | 32,180 | 26.3 | 23,417 | 72.8 | 1.06 (1.03 – 1.09) |
|  | 30-34 | 41,433 | 33.9 | 29,674 | 71.6 | 1 (reference) |
|  | 35-39 | 24,957 | 20.4 | 18,095 | 72.5 | 1.04 (1.01 – 1.08) |
|  | ≥40 | 6,141 | 5.0 | 4,596 | 74.8 | 1.18 (1.11 – 1.25) |
|  | Missing | 26 | <0.1 | 23 | 88.5 | 3.04 (0.91 – 10.1) |  |
| **Ethnic group** |
|  | White British | 30,009 | 25.7 | 20,012 | 66.7 | 1 (reference) | <0.001 |
|  | White Irish | 844 | 0.7 | 619 | 73.3 | 1.37 (1.18 - 1.60) |
|  | Other White | 21,590 | 18.5 | 16,081 | 74.5 | 1.46 (1.40 - 1.52) |
|  | Black African | 10,131 | 8.7 | 8,018 | 79.1 | 1.90 (1.80 – 2.00) |
|  | Black Caribbean | 2,682 | 2.3 | 1,886 | 70.3 | 1.18 (1.09 - 1.29) |
|  | Other Black | 3,520 | 3.0 | 2,670 | 75.9 | 1.57 (1.45 - 1.70) |
|  | Bangladeshi | 5,966 | 5.1 | 4,796 | 80.4 | 2.05 (1.91 - 2.19) |
|  | Pakistani | 4,749 | 4.1 | 3,596 | 75.7 | 1.56 (1.45 - 1.67) |
|  | Indian | 5,771 | 5.0 | 4,174 | 72.3 | 1.31 (1.23 - 1.39) |
|  | Other Asian | 5,419 | 4.6 | 4,039 | 74.5 | 1.46 (1.37 - 1.56) |
|  | White and Asian | 347 | 0.3 | 234 | 67.4 | 1.03 (0.83 - 1.30) |
|  | White and Black African | 479 | 0.4 | 358 | 74.7 | 1.48 (1.20 - 1.82) |
|  | White and Black Caribbean | 626 | 0.5 | 432 | 69.0 | 1.11 (0.94 - 1.32) |
|  | Other Mixed | 1,645 | 1.4 | 1,215 | 73.9 | 1.41 (1.26 - 1.58) |
|  | Chinese | 1,357 | 1.2 | 998 | 73.5 | 1.39 (1.23 - 1.57) |
|  | Other | 8,665 | 7.4 | 6,510 | 75.1 | 1.51 (1.43 - 1.59) |
|  | Missing | 18,475 | 15.8 | 13,482 | 73.0 | 1.35 (1.30 - 1.40) |  |
| **Country of birth** |
|  | Bangladesh | 748 | 0.6 | 585 | 78.2 | 1.27 (1.07 – 1.52) | <0.001 |
|  | Ghana | 955 | 0.8 | 746 | 78.1 | 1.27 (1.08 – 1.48) |
|  | India | 1,465 | 1.2 | 1,029 | 70.2 | 0.84 (0.74 – 0.94) |
|  | Lithuania | 609 | 0.5 | 471 | 77.3 | 1.21 (1.00 – 1.47) |
|  | Nigeria | 2,071 | 1.7 | 1,611 | 77.8 | 1.24 (1.11 – 1.38) |
|  | Pakistan | 1,400 | 1.1 | 1,018 | 72.7 | 0.94 (0.84 – 1.07) |
|  | Poland | 1,612 | 1.3 | 1,236 | 76.7 | 1.17 (1.03 – 1.31) |
|  | Romania | 1,389 | 1.1 | 1,100 | 79.2 | 1.35 (1.18 – 1.54) |
|  | Somalia | 541 | 0.4 | 446 | 82.4 | 1.66 (1.33 – 2.08) |
|  | Sri Lanka | 545 | 0.4 | 412 | 75.6 | 1.10 (0.90 – 1.34) |
|  | UK | 19,162 | 15.7 | 14,146 | 73.8 | 1 (reference) |
|  | Other | 13,248 | 10.8 | 10,374 | 78.3 | 1.28 (1.21 – 1.35) |
|  | Missing | 10,584 | 8.7 | 7,212 | 68.1 | 0.76 (0.72 – 0.80) |  |
|  | Trust not reported | 67,946 | 55.6 | 48,734 | 71.7 | 0.90 (0.87 – 0.93) |  |
| **First language other than English** |
|  | English | 60,278 | 49.3 | 43,845 | 72.7 | 1 (reference) | <0.001 |
|  | Other than English | 21,919 | 17.9 | 17,082 | 77.9 | 1.32 (1.28 – 1.37) |
|  | Missing | 3,058 | 2.5 | 2,263 | 74.0 | 1.07 (0.98 – 1.16) |  |
|  | Trust not reported | 37,020 | 30.3 | 25,930 | 70.0 | 0.88 (0.85 – 0.90) |  |
| **Religion** |
|  | Buddhist | 261 | 0.2 | 208 | 79.7 | 1.33 (0.98 – 1.80) | <0.001 |
|  | Christian | 17,080 | 14.0 | 12,753 | 74.7 | 1 (reference) |
|  | Hindu | 1,245 | 1.0 | 908 | 72.9 | 0.91 (0.80 – 1.04) |
|  | Jewish | 1,061 | 0.9 | 949 | 89.4 | 2.87 (2.36 – 3.51) |
|  | Muslim | 6,062 | 5.0 | 4,687 | 77.3 | 1.16 (1.08 – 1.24) |
|  | No religion | 7,625 | 6.2 | 5,686 | 74.6 | 0.99 (0.94 – 1.06) |
|  | Sikh | 542 | 0.4 | 387 | 71.4 | 0.85 (0.70 – 1.02) |
|  | Other | 5,982 | 4.9 | 4,721 | 78.9 | 1.27 (1.18 – 1.36) |
|  | Missing | 32,131 | 26.3 | 22,869 | 71.2 | 0.84 (0.80 – 0.87) |  |
|  | Trust not reported | 50,286 | 41.1 | 35,952 | 71.5 | 0.85 (0.82 – 0.89) |  |
| **History of livebirths** |
|  | 0 | 29,545 | 24.2 | 21,794 | 73.8 | 1 (reference) | <0.001 |
|  | 1 | 22,017 | 18.0 | 16,432 | 74.6 | 1.05 (1.01 – 1.09) |
|  | 2 | 9,177 | 7.5 | 7,212 | 78.6 | 1.31 (1.23 – 1.38) |
|  | 3 | 3,409 | 2.8 | 2,754 | 80.8 | 1.50 (1.37 – 1.63) |
|  | 4 | 1,368 | 1.1 | 1,180 | 86.3 | 2.23 (1.91 – 2.61) |
|  | ≥5 | 1,244 | 1.0 | 1,116 | 89.7 | 3.10 (2.58 – 3.73) |
|  | Missing | 11,844 | 9.7 | 8,875 | 74.9 | 1.06 (1.01 – 1.12) |  |
|  | Trust not reported | 43,671 | 35.7 | 29,757 | 68.1 | 0.76 (0.74 – 0.79) |  |
| **History of stillbirth** |
|  | Yes | 5,306 | 4.3 | 3,628 | 68.4 | 0.67 (0.63 – 0.72) | <0.001 |
|  | No | 59,323 | 48.5 | 45,239 | 76.3 | 1 (reference) |
|  | Missing | 8,164 | 6.7 | 5,501 | 67.4 | 0.64 (0.61 – 0.68) |  |
|  | Trust not reported | 49,482 | 40.5 | 34,752 | 70.2 | 0.73 (0.71 – 0.75) |  |
| **Disability** |
|  | Yes | 1,244 | 1.0 | 919 | 73.9 | 0.91 (0.80 – 1.04) | <0.001 |
|  | No | 55,656 | 45.5 | 42088 | 75.6 | 1 (reference) |
|  | Missing | 20,118 | 16.5 | 13195 | 65.6 | 0.61 (0.59 – 0.64) |  |
|  | Trust not reported | 45,257 | 37.0 | 32918 | 72.7 | 0.86 (0.84 – 0.88) |  |
| **Maternal employment** |
|  | Employed | 51,220 | 41.9 | 36,975 | 72.2 | 1 (reference) | <0.001 |
|  | Unemployed | 4,675 | 3.8 | 3,748 | 80.2 | 1.56 (1.45 – 1.68) |
|  | Homemaker | 15,176 | 12.4 | 11,668 | 76.9 | 1.28 (1.23 – 1.34) |
|  | Long term sick/ disabled | 629 | 0.5 | 511 | 81.2 | 1.67 (1.36 – 2.04) |
|  | Student | 2,078 | 1.7 | 1,586 | 76.3 | 1.24 (1.12 – 1.38) |
|  | Other | 2,370 | 1.9 | 1,785 | 75.3 | 1.18 (1.07 – 1.29) |
|  | Missing | 12,448 | 10.2 | 9,993 | 80.3 | 1.57 (1.49 – 1.65) |  |
|  | Trust not reported | 33,679 | 27.5 | 22,854 | 67.9 | 0.81 (0.79 – 0.84) |  |
| **Smoking** |
|  | Current smoker | 5,874 | 4.8 | 4,299 | 73.2 | 1.00 (0.94 – 1.06) | <0.001 |
|  | Ex-smoker | 12,237 | 10.0 | 8,485 | 69.3 | 0.83 (0.79 – 0.87) |
|  | Non-smoker | 19,399 | 15.9 | 15,264 | 78.7 | 1.35 (1.30 – 1.41) |
|  | Never smoked | 43,058 | 35.2 | 31,506 | 73.2 | 1 (reference) |
|  | Missing | 17,291 | 14.1 | 12,486 | 72.2 | 0.95 (0.92 – 0.99) |  |
|  | Trust not reported | 24,416 | 20.0 | 17,080 | 70.0 | 0.85 (0.82 – 0.88) |  |
| **Substance misuse** |
|  | Current | 378 | 0.3 | 266 | 70.4 | 0.84 (0.67 – 1.05) | <0.001 |
|  | Previous | 2,328 | 1.9 | 1,637 | 70.3 | 0.84 (0.76 – 0.92) |
|  | Never | 70,086 | 57.3 | 51,798 | 73.9 | 1 (reference) |
|  | Missing | 12,599 | 10.3 | 9,710 | 77.1 | 1.19 (1.13 – 1.24) |  |
|  | Trust not reported | 36,884 | 30.2 | 25,709 | 69.7 | 0.81 (0.79 – 0.84) |  |
| **Complex social needs** |
|  | No | 63,417 | 51.9 | 45,208 | 71.3 | 1 (reference) | <0.001 |
|  | Yes | 10,618 | 8.7 | 7,492 | 70.6 | 0.97 (0.92 – 1.01) |
|  | Missing | 4,384 | 3.6 | 2,937 | 67.0 | 0.82 (0.77 – 0.87) |  |
|  | Trust not reported | 43,856 | 35.9 | 33,483 | 76.3 | 1.30 (1.26 – 1.34) |  |
| **Support from family or friends** |
|  | No | 2,035 | 1.7 | 1553 | 76.3 | 1.29 (1.17 – 1.43) | <0.001 |
|  | Yes | 58,512 | 47.9 | 41758 | 71.4 | 1 (reference) |
|  | Missing | 8,742 | 7.1 | 7112 | 81.4 | 1.75 (1.65 – 1.85) |  |
|  | Trust not reported | 52,986 | 43.3 | 38697 | 73.0 | 1.09 (1.06 – 1.12) |  |
| **Family type** |
|  | One parent | 5,479 | 4.5 | 4,334 | 79.1 | 1.23 (1.15 – 1.32) | <0.001 |
|  | Two parent | 29,410 | 24.1 | 22,177 | 75.4 | 1 (reference) |
|  | Missing | 2,787 | 2.3 | 2,038 | 73.1 | 0.89 (0.81 – 0.97) |  |
|  | Trust not reported | 84,599 | 69.2 | 60,571 | 71.6 | 0.82 (0.80 – 0.85) |  |
| **Partner’s employment** |
|  | Employed | 57,515 | 47.0 | 42,406 | 73.7 | 1 (reference) | <0.001 |
|  | Unemployed | 2,415 | 2.0 | 1,852 | 76.7 | 1.17 (1.06 – 1.29) |
|  | Homemaker | 621 | 0.5 | 526 | 84.7 | 1.97 (1.58 – 2.46) |
|  | Long term sick/ disabled | 200 | 0.2 | 148 | 74.0 | 1.01 (0.74 – 1.39) |
|  | Student | 1,239 | 1.0 | 1,043 | 84.2 | 1.90 (1.63 – 2.21) |
|  | Other | 572 | 0.5 | 480 | 83.9 | 1.86 (1.49 – 2.33) |
|  | Missing | 19,906 | 16.3 | 15,669 | 78.7 | 1.32 (1.27 – 1.37) |  |
|  | Trust not reported | 39,807 | 32.6 | 26,996 | 67.8 | 0.75 (0.73 – 0.77) |  |

a. χ2 test, excluding categories “Missing” and “Trust not reported”

**Table II: Association of maternal and referral characteristics with referral after 8 weeks gestation, or booking > 2 weeks after referral, among bookings with a referral date available (n=70,947)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Bookings in analysis (n=70,947)** | **Referral > 8 weeks gestation** | **Booking >2 weeks after referral date** |
| **Referred > 8 weeks gestation** | **Odds ratio** **(95% CI)** | **P value**a | **Booked >2 weeks after referral** | **Odds ratio** **(95% CI)** | **P value**a |
| **n** | **col %** | **n** | **row %** | **n** | **row %** |
| **Deprivation (London Index of Multiple Deprivation quintile)** |
|  | 5 (most deprived) | 17,678 | 24.9 | 9,919 | 56.1 | 0.92 (0.87 - 0.97) | <0.001 | 13,058 | 73.9 | 2.25 (2.13 - 2.38) | <0.001 |
|  | 4 | 18,746 | 26.4 | 10,088 | 53.8 | 0.84 (0.79 - 0.88) | 13,931 | 74.3 | 2.31 (2.18 - 2.44) |
|  | 3 | 16,621 | 23.4 | 8,963 | 53.9 | 0.84 (0.80 - 0.89) | 11,394 | 68.6 | 1.74 (1.64 - 1.83) |
|  | 2 | 9,280 | 13.1 | 5,106 | 55.0 | 0.88 (0.83 - 0.93) | 5,991 | 64.6 | 1.45 (1.37 - 1.54) |
|  | 1 (least deprived) | 8,008 | 11.3 | 4,660 | 58.2 | 1 (reference) | 4,457 | 55.7 | 1 (reference) |
|  | Missing | 614 | 0.9 | 361 | 58.8 | 1.03 (0.87 - 1.21) |  | 413 | 67.3 | 1.64 (1.38 - 1.95) |  |
| **Age (years)** |
|  | <20 | 1,607 | 2.3 | 1,066 | 66.3 | 1.76 (1.59 - 1.96) | <0.001 | 988 | 61.5 | 0.70 (0.63 - 0.78) | <0.001 |
|  | 20-24 | 9,296 | 13.1 | 5,461 | 58.7 | 1.28 (1.21 - 1.34) | 6,445 | 69.3 | 0.99 (0.94 - 1.04) |
|  | 25-29 | 19,985 | 28.2 | 10,784 | 54.0 | 1.05 (1.01 - 1.09) | 14,161 | 70.9 | 1.06 (1.02 - 1.11) |
|  | 30-34 | 23,409 | 33.0 | 12,349 | 52.8 | 1 (reference) | 16,280 | 69.5 | 1 (reference) |
|  | 35-39 | 13,368 | 18.8 | 7,417 | 55.5 | 1.12 (1.07 - 1.16) | 9,145 | 68.4 | 0.95 (0.91 - 0.99) |
|  | ≥40 | 3,259 | 4.6 | 2,002 | 61.4 | 1.43 (1.32 - 1.54) | 2,221 | 68.1 | 0.94 (0.87 - 1.01) |
|  | Missing | 23 | 0.0 | 18 | 78.3 | 3.22 (1.20 - 8.69) |  | <5 | 17.4 | 0.09 (0.03 - 0.27) |  |
| **Ethnic group** |
|  | White British | 15,238 | 21.5 | 7,852 | 51.5 | 1 (reference) | <0.001 | 9,789 | 64.2 | 1 (reference) | <0.001 |
|  | White Irish | 412 | 0.6 | 230 | 55.8 | 1.19 (0.98 - 1.45) | 279 | 67.7 | 1.17 (0.95 - 1.44) |
|  | Other White | 12,492 | 17.6 | 6,945 | 55.6 | 1.18 (1.12 - 1.23) | 8,984 | 71.9 | 1.43 (1.35 - 1.50) |
|  | Black African | 5,909 | 8.3 | 3,680 | 62.3 | 1.55 (1.46 - 1.65) | 4,289 | 72.6 | 1.47 (1.38 - 1.57) |
|  | Black Caribbean | 1,186 | 1.7 | 630 | 53.1 | 1.07 (0.95 - 1.20) | 834 | 70.3 | 1.32 (1.16 - 1.50) |
|  | Other Black | 1,629 | 2.3 | 905 | 55.6 | 1.18 (1.06 - 1.30) | 1,143 | 70.2 | 1.31 (1.17 - 1.46) |
|  | Bangladeshi | 5,036 | 7.1 | 2,971 | 59.0 | 1.35 (1.27 - 1.44) | 3,703 | 73.5 | 1.55 (1.44 - 1.66) |
|  | Pakistani | 3,353 | 4.7 | 1,804 | 53.8 | 1.10 (1.02 - 1.18) | 2,529 | 75.4 | 1.71 (1.57 - 1.86) |
|  | Indian | 4,052 | 5.7 | 1,929 | 47.6 | 0.85 (0.80 - 0.92) | 3,038 | 75.0 | 1.67 (1.54 - 1.80) |
|  | Other Asian | 3,402 | 4.8 | 1,952 | 57.4 | 1.27 (1.17 - 1.36) | 2,332 | 68.5 | 1.21 (1.12 - 1.31) |
|  | White and Asian | 176 | 0.2 | 82 | 46.6 | 0.82 (0.61 - 1.11) | 129 | 73.3 | 1.53 (1.09 - 2.14) |
|  | White and Black African | 192 | 0.3 | 91 | 47.4 | 0.85 (0.64 - 1.13) | 129 | 67.2 | 1.14 (0.84 - 1.54) |
|  | White and Black Caribbean | 314 | 0.4 | 168 | 53.5 | 1.08 (0.87 - 1.35) | 215 | 68.5 | 1.21 (0.95 - 1.54) |
|  | Other Mixed | 1,020 | 1.4 | 565 | 55.4 | 1.17 (1.03 - 1.33) | 703 | 68.9 | 1.23 (1.08 - 1.42) |
|  | Chinese | 740 | 1.0 | 424 | 57.3 | 1.26 (1.09 - 1.47) | 525 | 70.9 | 1.36 (1.16 - 1.60) |
|  | Other | 6,011 | 8.5 | 3,451 | 57.4 | 1.27 (1.19 - 1.35) | 4,011 | 66.7 | 1.12 (1.05 - 1.19) |
|  | Missing | 9,785 | 13.8 | 5,418 | 55.4 | 1.17 (1.11 - 1.23) |  | 6,612 | 67.6 | 1.16 (1.10 - 1.22) |  |
| **Country of birth** |
|  | Bangladesh | 223 | 0.3 | 136 | 61.0 | 0.59 (0.45 - 0.78) | <0.001 | 128 | 57.4 | 1.74 (1.33 - 2.28) | <0.001 |
|  | Ghana | 326 | 0.5 | 208 | 63.8 | 0.67 (0.53 - 0.85) | 188 | 57.7 | 1.76 (1.41 - 2.21) |
|  | India | 533 | 0.8 | 356 | 66.8 | 0.77 (0.63 - 0.92) | 246 | 46.2 | 1.11 (0.93 - 1.32) |
|  | Lithuania | 123 | 0.2 | 73 | 59.3 | 0.56 (0.39 - 0.80) | 64 | 52.0 | 1.40 (0.98 - 2.00) |
|  | Nigeria | 361 | 0.5 | 226 | 62.6 | 0.64 (0.51 - 0.79) | 218 | 60.4 | 1.97 (1.59 - 2.45) |
|  | Pakistan | 419 | 0.6 | 298 | 71.1 | 0.94 (0.75 - 1.17) | 177 | 42.2 | 0.95 (0.77 - 1.15) |
|  | Poland | 588 | 0.8 | 397 | 67.5 | 0.79 (0.66 - 0.95) | 312 | 53.1 | 1.46 (1.23 - 1.73) |
|  | Romania | 582 | 0.8 | 381 | 65.5 | 0.72 (0.60 - 0.86) | 322 | 55.3 | 1.60 (1.35 - 1.90) |
|  | Somalia | 139 | 0.2 | 93 | 66.9 | 0.77 (0.54 - 1.10) | 89 | 64.0 | 2.30 (1.62 - 3.26) |
|  | Sri Lanka | 230 | 0.3 | 186 | 80.9 | 1.61 (1.15 - 2.24) | 64 | 27.8 | 0.50 (0.37 - 0.67) |
|  | UK | 6,077 | 8.6 | 4,402 | 72.4 | 1 (reference) | 2,651 | 43.6 | 1 (reference) |
|  | Other | 4,635 | 6.5 | 2,983 | 64.4 | 0.69 (0.63 - 0.75) | 2,578 | 55.6 | 1.62 (1.50 - 1.75) |
|  | Missing | 4,467 | 6.3 | 2,279 | 51.0 | 0.40 (0.37 - 0.43) |  | 2,841 | 63.6 | 2.26 (2.09 - 2.44) |  |
|  | Trust not reported | 52,244 | 73.6 | 27,079 | 51.8 | 0.41 (0.39 - 0.43) |  | 39,366 | 75.4 | 3.95 (3.74 - 4.17) |  |
| **First language other than English** |
|  | English | 32,662 | 46.0 | 18,020 | 55.2 | 1 (reference) | <0.001 | 20,994 | 64.3 | 1 (reference) | <0.001 |
|  | Other than English | 9,356 | 13.2 | 5,444 | 58.2 | 1.13 (1.08 - 1.18) | 6,719 | 71.8 | 1.42 (1.35 - 1.49) |
|  | Missing | 2,548 | 3.6 | 1,422 | 55.8 | 1.03 (0.95 - 1.11) |  | 1,785 | 70.1 | 1.30 (1.19 - 1.42) |  |
|  | Trust not reported | 26,381 | 37.2 | 14,211 | 53.9 | 0.95 (0.92 - 0.98) |  | 19,746 | 74.8 | 1.65 (1.60 - 1.71) |  |
| **Religion** |
|  | Buddhist | 87 | 0.1 | 53 | 60.9 | 0.91 (0.59 - 1.40) | <0.001 | 59 | 67.8 | 1.74 (1.11 - 2.73) | <0.001 |
|  | Christian | 6,727 | 9.5 | 4,255 | 63.3 | 1 (reference) | 3,686 | 54.8 | 1 (reference) |
|  | Hindu | 609 | 0.9 | 357 | 58.6 | 0.82 (0.70 - 0.97) | 343 | 56.3 | 1.06 (0.90 - 1.26) |
|  | Jewish | 894 | 1.3 | 618 | 69.1 | 1.30 (1.12 - 1.51) | 701 | 78.4 | 3.00 (2.54 - 3.54) |
|  | Muslim | 2,877 | 4.1 | 1,675 | 58.2 | 0.81 (0.74 - 0.89) | 1,895 | 65.9 | 1.59 (1.45 - 1.74) |
|  | No religion | 3,558 | 5.0 | 2,152 | 60.5 | 0.89 (0.82 - 0.97) | 2,067 | 58.1 | 1.14 (1.05 - 1.24) |
|  | Sikh | 276 | 0.4 | 108 | 39.1 | 0.37 (0.29 - 0.48) | 222 | 80.4 | 3.39 (2.51 - 4.58) |
|  | Other | 1,612 | 2.3 | 1,564 | 97.0 | 18.9 (14.1 - 25.3) | 62 | 3.8 | 0.03 (0.03 - 0.04) |
|  | Missing | 15,713 | 22.1 | 8,188 | 52.1 | 0.63 (0.60 - 0.67) |  | 10,841 | 69.0 | 1.84 (1.73 - 1.95) |  |
|  | Trust not reported | 38,594 | 54.4 | 20,127 | 52.2 | 0.63 (0.60 - 0.67) |  | 29,368 | 76.1 | 2.63 (2.49 – 2.77) |  |
| **History of livebirths** |
|  | 0 | 22,569 | 31.8 | 11,972 | 53.0 | 1 (reference) | <0.001 | 15,423 | 68.3 | 1 (reference) | <0.001 |
|  | 1 | 16,307 | 23.0 | 8,739 | 53.6 | 1.02 (0.98 - 1.06) | 11,064 | 67.8 | 0.98 (0.94 - 1.02) |
|  | 2 | 6,776 | 9.6 | 4,077 | 60.2 | 1.34 (1.27 - 1.41) | 4,614 | 68.1 | 0.99 (0.93 - 1.05) |
|  | 3 | 2,515 | 3.5 | 1,597 | 63.5 | 1.54 (1.41 - 1.68) | 1,722 | 68.5 | 1.01 (0.92 - 1.10 |
|  | 4 | 1,019 | 1.4 | 729 | 71.5 | 2.23 (1.94 - 2.56) | 676 | 66.3 | 0.91 (0.80 - 1.04) |
|  | ≥5 | 966 | 1.4 | 778 | 80.5 | 3.66 (3.12 - 4.30) | 627 | 64.9 | 0.86 (0.75 - 0.98) |
|  | Missing | 6,510 | 9.2 | 4,231 | 65.0 | 1.64 (1.55 - 1.74) |  | 4,105 | 63.1 | 0.79 (0.75 - 0.84) |  |
|  | Trust not reported | 14,285 | 20.1 | 6,974 | 48.8 | 0.84 (0.81 - 0.88) |  | 11,013 | 77.1 | 1.56 (1.49 - 1.64) |  |
| **History of stillbirth** |
|  | Yes | 4,965 | 7.0 | 2,575 | 51.9 | 0.80 (0.76 - 0.85) | <0.001 | 3,544 | 71.4 | 1.24 (1.16 - 1.32) | <0.001 |
|  | No | 43,128 | 60.8 | 24,716 | 57.3 | 1 (reference) | 28,792 | 66.8 | 1 (reference) |
|  | Missing | 2,889 | 4.1 | 2,128 | 73.7 | 2.08 (1.91 - 2.27) |  | 1,253 | 43.4 | 0.38 (0.35 - 0.41) |  |
|  | Trust not reported | 19,965 | 28.1 | 9,678 | 48.5 | 0.70 (0.68 - 0.72) |  | 15,655 | 78.4 | 1.81 (1.74 - 1.88) |  |
| **Disability** |
|  | Yes | 366 | 0.5 | 248 | 67.8 | 1.42 (1.14 - 1.77) | <0.001 | 183 | 50.0 | 0.67 (0.55 - 0.83) | <0.001 |
|  | No | 23,417 | 33.0 | 13,969 | 59.7 | 1 (reference) | 14,009 | 59.8 | 1 (reference) |
|  | Missing | 9,057 | 12.8 | 4,873 | 53.8 | 0.79 (0.75 - 0.83) |  | 6,049 | 66.8 | 1.35 (1.28 - 1.42) |  |
|  | Trust not reported | 38,107 | 53.7 | 20,007 | 52.5 | 0.75 (0.72 - 0.77) |  | 29,003 | 76.1 | 2.14 (2.07 - 2.22) |  |
| **Maternal employment** |
|  | Employed | 26,730 | 37.7 | 14,430 | 54.0 | 1 (reference | <0.001 | 17,949 | 67.1 | 1 (reference) | <0.001 |
|  | Unemployed | 2,480 | 3.5 | 1,471 | 59.3 | 1.24 (1.14 - 1.35) | 1,748 | 70.5 | 1.17 (1.07 - 1.28) |
|  | Homemaker | 8,025 | 11.3 | 4,968 | 61.9 | 1.39 (1.32 - 1.46) | 5,354 | 66.7 | 0.98 (0.93 - 1.03) |
|  | Long term sick/ disabled | 63 | 0.1 | 46 | 73.0 | 2.31 (1.32 - 4.03) | 25 | 39.7 | 0.32 (0.19 - 0.53) |
|  | Student | 908 | 1.3 | 517 | 56.9 | 1.13 (0.99 - 1.29) | 628 | 69.2 | 1.10 (0.95 - 1.27) |
|  | Other | 1,120 | 1.6 | 781 | 69.7 | 1.96 (1.72 - 2.24) | 615 | 54.9 | 0.60 (0.53 - 0.67) |
|  | Missing | 4,886 | 6.9 | 3,450 | 70.6 | 2.05 (1.92 - 2.19) |  | 2,822 | 57.8 | 0.67 (0.63 - 0.71) |  |
|  | Trust not reported | 26,735 | 37.7 | 13,434 | 50.2 | 0.86 (0.83 - 0.89) |  | 20,103 | 75.2 | 1.48 (1.43 - 1.54) |  |
| **Smoking** |
|  | Current smoker | 2,921 | 4.1 | 1,748 | 59.8 | 1.28 (1.19 - 1.39) | <0.001 | 1,801 | 61.7 | 0.58 (0.538 - 0.63) | <0.001 |
|  | Ex-smoker | 5,080 | 7.2 | 2,373 | 46.7 | 0.76 (0.71 - 0.80) | 3,924 | 77.2 | 1.22 (1.14 - 1.31) |
|  | Non-smoker | 13,069 | 18.4 | 8,264 | 63.2 | 1.48 (1.42 - 1.55) | 6,670 | 51.0 | 0.38 (0.36 - 0.39) |
|  | Never smoked | 23,016 | 32.4 | 12,360 | 53.7 | 1 (reference) | 16,921 | 73.5 | 1 (reference) |
|  | Missing | 9,321 | 13.1 | 5,068 | 54.4 | 1.03 (0.98 - 1.08) |  | 5,970 | 64.0 | 0.64 (0.61 - 0.68) |  |
|  | Trust not reported | 17,540 | 24.7 | 9,284 | 52.9 | 0.97 (0.93 - 1.01) |  | 13,958 | 79.6 | 1.40 (1.34 - 1.47) |  |
| **Substance misuse** |
|  | Current | 210 | 0.3 | 111 | 52.9 | 0.85 (0.65 - 1.12) | <0.001 | 137 | 65.2 | 1.11 (0.83 - 1.47) | <0.001 |
|  | Previous | 602 | 0.8 | 350 | 58.1 | 1.05 (0.90 - 1.24) | 364 | 60.5 | 0.90 (0.77 - 1.06) |
|  | Never | 36,995 | 52.1 | 21,025 | 56.8 | 1 (reference) | 23,256 | 62.9 | 1 (reference) |
|  | Missing | 3,387 | 4.8 | 2,411 | 71.2 | 1.88 (1.74 - 2.03) |  | 1,907 | 56.3 | 0.76 (0.71 - 0.82) |  |
|  | Trust not reported | 29,753 | 41.9 | 15,200 | 51.1 | 0.79 (0.77 - 0.82) |  | 23,580 | 79.3 | 2.26 (2.18 - 2.34) |  |
| **Complex social needs** |
|  | No | 22,709 | 32.0 | 11,396 | 50.2 | 1 (reference) | <0.001 | 16,628 | 73.2 | 1 (reference) | <0.001 |
|  | Yes | 1,237 | 1.7 | 763 | 61.7 | 1.60 (1.42 - 1.80) | 723 | 58.4 | 0.51 (0.46 - 0.58) |
|  | Missing | 3,691 | 5.2 | 2,112 | 57.2 | 1.33 (1.24 - 1.42) |  | 2,518 | 68.2 | 0.79 (0.73 - 0.85) |  |
|  | Trust not reported | 43,310 | 61.0 | 24,826 | 57.3 | 1.33 (1.29 - 1.38) |  | 29,375 | 67.8 | 0.77 (0.74 - 0.80) |  |
| **Support from family or friends** |
|  | No | 427 | 0.6 | 291 | 68.1 | 1.80 (1.47 - 2.22) | <0.001 | 234 | 54.8 | 0.53 (0.44 - 0.65) | <0.001 |
|  | Yes | 20,247 | 28.5 | 10,983 | 54.2 | 1 (reference) |  | 14,066 | 69.5 | 1 (reference) |
|  | Missing | 4,609 | 6.5 | 2,888 | 62.7 | 1.42 (1.33 - 1.51) |  | 2,681 | 58.2 | 0.61 (0.57 - 0.65) |  |
|  | Trust not reported | 45,664 | 64.4 | 24,935 | 54.6 | 1.01 (0.98 - 1.05) |  | 32,263 | 70.7 | 1.06 (1.02 - 1.10 |  |
| **Family type** |
|  | One parent | 846 | 1.2 | 597 | 70.6 | 1.51 (1.30 - 1.75) | <0.001 | 426 | 50.4 | 0.79 (0.68 - 0.90) | <0.001 |
|  | Two parent | 20,399 | 28.8 | 12,529 | 61.4 | 1 (reference) | 11,498 | 56.4 | 1 (reference) |
|  | Missing | 2,085 | 2.9 | 1,114 | 53.4 | 0.72 (0.66 - 0.79) |  | 1,481 | 71.0 | 1.90(1.72 - 2.09) |  |
|  | Trust not reported | 47,617 | 67.1 | 24,857 | 52.2 | 0.69 (0.66 - 0.71) |  | 35,839 | 75.3 | 2.36 (2.28 - 2.44) |  |
| **Partner’s employment** |
|  | Employed | 27,613 | 38.9 | 15,752 | 57.0 | 1 (reference) | <0.001 | 17,829 | 64.6 | 1 (reference) | <0.001 |
|  | Unemployed | 1,055 | 1.5 | 634 | 60.1 | 1.13 (1.00 - 1.29) |  | 703 | 66.6 | 1.10 (0.96 - 1.25) |
|  | Homemaker | 488 | 0.7 | 351 | 71.9 | 1.93 (1.58 - 2.35) |  | 262 | 53.7 | 0.64 (0.53 - 0.76) |
|  | Long term sick/ disabled | 47 | 0.1 | 29 | 61.7 | 1.21 (0.67 - 2.19) |  | 25 | 53.2 | 0.62 (0.35 - 1.11) |
|  | Student | 632 | 0.9 | 398 | 63.0 | 1.28 (1.09 - 1.51) |  | 489 | 77.4 | 1.88 (1.56 - 2.266) |
|  | Other | 398 | 0.6 | 305 | 76.6 | 2.45 (1.96 - 3.12) |  | 196 | 49.2 | 0.536 (0.44 - 0.65) |
|  | Missing | 7,933 | 11.2 | 5,102 | 64.3 | 1.36 (1.29 - 1.43) |  | 5,022 | 63.3 | 0.95 (0.90 – 1.00) |  |
|  | Trust not reported | 32,781 | 46.2 | 16,526 | 50.4 | 0.77 (0.74 - 0.79) |  | 24,718 | 75.4 | 1.68 (1.62 - 1.74) |  |
| **Gestation at referral** |
|  | < 10 weeks | 17,678 | 64.7 |  | 39,009 | 85.0 | 9.50 (9.10 - 9.92) | <0.001 |
|  | 10-12 weeks | 18,746 | 19.3 | 5,116 | 37.3 | 1 (reference) |
|  | 13-21 weeks | 16,621 | 9.6 | 3,412 | 50.1 | 1.69 (1.60 - 1.80) |
|  | ≥ 22 weeks | 9,280 | 6.3 | 1,707 | 37.9 | 1.03 (0.96 - 1.10) |
| **Referral source** |
|  | GP | 48,166 | 67.9 | 26,682 | 55.4 | 1 (reference) | <0.001b | 33322 | 69.2 | 1 (reference) | <0.001b |
|  | Other clinical | 755 | 1.1 | 535 | 70.9 | 1.96 (1.67 - 2.29) | 420 | 55.6 | 0.56 (0.48 - 0.65) |
|  | Self | 12,581 | 17.7 | 7,121 | 56.6 | 1.05 (1.01 - 1.09) | 9156 | 72.8 | 1.19 (1.14 - 1.24) |
|  | Transfer | 63 | 0.1 | 63 | 100.0 | n/a |  | 0 | 0 | n/a |  |
|  | Missing | 3,867 | 5.5 | 2,364 | 61.1 | 1.27 (1.18 - 1.35) |  | 2312 | 59.8 | 0.66 (0.62 - 0.71) |  |
|  | Trust not reported | 5,515 | 7.8 | 2,332 | 42.3 | 0.59 (0.56 - 0.62) |  | 4034 | 73.1 | 1.21 (1.14 - 1.29) |  |
| **Professional seen at booking** |
|  | Consultant | 5314 | 7.5 | 3,567 | 67.1 | 1.39 (1.30 - 1.49) | <0.001 | 2768 | 52.1 | 0.69 (0.64 - 0.73) | <0.001 |
|  | GP | 4446 | 6.3 | 2,038 | 45.8 | 0.58 (0.54 - 0.62) | 3443 | 77.4 | 2.16 (2.00 - 2.34) |
|  | Midwife | 12709 | 17.9 | 7,557 | 59.5 | 1 (reference) | 7794 | 61.3 | 1 (reference) |
|  | Other | 859 | 1.2 | 387 | 45.1 | 0.56 (0.48 - 0.64) | 619 | 72.1 | 1.63 (1.40 - 1.90) |
|  | Missing | 5682 | 8.0 | 3393 | 59.7 | 1.01 (0.95 - 1.08) |  | 3423 | 60.2 | 0.96 (0.90 - 1.02) |  |
|  | Trust not reported | 41937 | 59.1 | 22153 | 52.8 | 0.76 (0.73 - 0.79) |  | 31197 | 74.4 | 1.83 (1.76 - 1.91) |  |

a. χ2 test, excluding categories “Missing” and “Trust not reported”

b. Excludes transfers