Public Health England

Protecting and improving the nation's health

Characteristics of women who stop smoking in pregnancy

Experimental analysis of smoking data from the Maternity Services Data Set (MSDS) April 2018 to March 2019

Contents

Purpose of the report

This report is aimed at professionals developing health improvement policies to reduce smoking and commissioners or providers of stop smoking services. It examines the characteristics of women who report that they stop smoking during pregnancy. The results can be used to inform population-level stop smoking campaigns aimed towards women who are planning a pregnancy and to inform the targeting of stop smoking services for pregnant women.

The data in this report generates breakdowns by different potential causes of inequality for those women who were smoking when they gave birth ('smoking at delivery'). In the longer term we propose to include the proportion of women who quit smoking during pregnancy in the Public Health Outcomes Framework.

Executive summary

Smoking is the largest preventable cause of mortality, morbidity, and inequalities in health in England (1). Smoking during pregnancy can cause serious pregnancy-related health problems including complications during labour and an increased risk of miscarriage, premature birth, stillbirth, low birthweight and sudden unexpected death in infancy (2).

Methodology

The report analyses data from all maternity services in England and is based on an extract of delivery data recorded in the Maternity Services Data Set (MSDS) for the financial year April 2018 to March 2019 for babies born to women who were resident in England. It presents information collected by services at the maternity booking appointment and at delivery about the woman's self-reported smoking status before pregnancy, at booking and at delivery. As the smoking status was self-reported, there may be a degree of bias from those responding, and the true figures may be higher than recorded within the MSDS. The analysis compares demographic, socioeconomic, social complexity and lifestyle factors and those about the timely use of maternity services.

Main findings

Where the smoking status was known, most women reported that they had never smoked (71.5%) or had given up smoking before conceiving (ex-smokers) (14.5%). One in 7 women (14.0%) said that they were smokers at the time their baby was conceived but, by the time of delivery, this proportion had reduced to 6.7%.

Among those who were smokers at the time they conceived ('smokers at conception'), 33.0% stopped smoking in early pregnancy (before attending their booking appointment). The highest proportions of smokers at conception who stopped smoking in early pregnancy were among women who were in the following groups:

- in their 30s (37.0% aged 30 to 34, 37.6% aged 35 to 39)
- of Asian (38.5%) or Black ethnicity (37.7%)
- living in areas of affluence (56.5% in the least deprived decile)
- living in the South East (45.4%), London (37.7%) or the South West (37.3%)
- in employment (44.6%)
- without complex social factors (34.3%)
- not misusing substances (33.7%)
- not drinking alcohol (35.0%)
- pregnant for the first time (41.9%)
- booking within 10 completed weeks of pregnancy (35.8%)

Among those who were smokers at the time they attended their first midwife appointment ('smokers at booking'), 36.3% stopped smoking in late pregnancy. The highest proportions of smokers at booking who stopped smoking in late pregnancy (and before delivery) were in women who were:

- younger (38.7% women aged under 20)
- of Asian (59.4%) or Black ethnicity (48.5%)
- living in more affluent areas (42.3% in the least deprived decile)
- living in the North East (49.6%) or the North West (40.6%)
- in employment (42.0%)
- without complex social factors (38.2%)
- those who drank one or more unit of alcohol per week (50.4%)
- pregnant for the first time (45.4%)
- booking within 10 completed weeks of pregnancy (38.0%)

Among smokers at booking, 63.7% were still smokers at the time of delivery. The highest proportions of smokers at booking who continued to smoke were in women who were:

- of White ethnicity (64.8%)
- living in areas of deprivation (66.6%)
- living in the East Midlands (72.5%)
- not in employment (71.3%)
- with complex social factors (68.3%)
- currently (72.8%) or previously (69.9%) misusing substances
- experiencing a subsequent pregnancy (68.3%)
- booking after 13 weeks of pregnancy (67.8% 13 to 20 weeks, 72.6% over 20 weeks)

Conclusion

Overall, the characteristics of women who stop smoking during pregnancy (either in early or late pregnancy) were similar to the characteristics of women who never smoke. The exceptions to this were women under 20 who were the most likely age group to be smokers at booking but also had the highest proportion of those who stopped smoking in late pregnancy. In addition, there were also some notable differences at regional level with regards to the proportion of women who stopped smoking and the point at which they did so. Differences at a regional level may be associated with the localised distribution of risk factors among pregnant women, responsiveness to national and local health promotion campaigns and variability in the services provided.

Introduction

Smoking in pregnancy has well-known detrimental effects for the growth and development of the baby and health of the woman. Smoking during pregnancy can cause serious pregnancy-related health problems. These include complications during labour and an increased risk of miscarriage, premature birth, stillbirth, low birthweight and sudden unexpected death in infancy (2).

Encouraging pregnant women to stop smoking during pregnancy may also help them quit for good, and thus provide health benefits for the woman and reduce exposure to second-hand smoke by the infant and other members of the household and family.

In 2016, the Better Births report (3) set out an ambitious vision for the future of maternity services in England and the Maternity Transformation Programme (MTP) was formed to carry out these recommendations. The MTP was made up of 9 workstreams, including improving prevention which aimed to prevent poor outcomes by improving women's health before, during and after pregnancy. Several initiatives were put in place, including the Saving Babies' Lives Care Bundle (2019) (4) which was developed to help reduce stillbirths and neonatal deaths. Reducing smoking in pregnancy was identified as one of the bundle's 5 elements of care. Carbon monoxide (CO) testing for all women at the antenatal booking appointment, and as appropriate throughout pregnancy, is now being used to identify smokers (or those exposed to tobacco smoke) and to generate an opt-out referral for support from a trained stop smoking advisor. Furthermore, the NHS long term plan (2019) (5) will provide a new smoke-free pregnancy pathway including focused sessions and treatment to support expectant women and their partners to quit. NICE guidance (2010) (6) provides the evidence-based model for stop smoking support within maternity settings.

The results from this analysis will help to identify opportunities for additional interventions by healthcare professionals and health promotion and social media activity. Messages around the importance of a smoke-free life may need to be tailored for specific groups of women. It is important to encourage women who are planning to have a baby to stop smoking in advance of conception, but also remind them that if they do smoke, stopping smoking at any point of the pregnancy is beneficial for both mother and baby (7). Provision of tailored support and advice is important to achieving a reduction in the number of women who smoke in pregnancy or who are identified as being exposed to tobacco smoke through CO testing. In the case of women exposed to tobacco smoke from partners or others living in the home, some of the messaging may also need targeting at wider family members.

Methodology

The Maternity Services Data Set (MSDS) is a national data set which collects and reports information on maternity care in England. It has been implemented by all maternity services in England, including acute trusts, foundation trusts and private services commissioned by the NHS. The data set is currently classed as experimental[1], published in order to involve stakeholders in its development. More information about the data set is available from NHS Digital.

A woman's smoking status should be recorded when she is booked in to receive maternity services (the booking appointment, which should ideally occur before a woman is 10 weeks pregnant), as well as the number of cigarettes she smokes (if applicable). A woman is also asked her smoking status at or immediately after the birth of her baby, often referred to as 'at delivery'. The data recorded in the MSDS and used in this report is self-reported and based on the woman's responses rather than objective measurements from CO monitoring. The newer version of the MSDS now includes CO reading so this can be examined further in the future.

This report analyses data from all maternity services in England and is based on an extract of delivery data recorded in the MSDS for the financial year April 2018 to March 2019 for babies born to women who were resident in England. It presents information on the woman's smoking status before pregnancy, at conception, at the booking appointment and at delivery, making comparisons by demographic, socioeconomic, social complexity and lifestyle factors and those relating to timely use of maternity services.

Limitations and data quality

Maternity care providers began submitting data to the MSDS for activity from April 2015. There has been variation in how quickly and how successfully providers have managed to flow their data to the national data set. For the financial year 2018 to 2019, 130 providers successfully submitted data to the data set and the data is estimated to be around 91% complete when compared with deliveries in the Hospital Episode Statistics. The data set is still classed as experimental as not all data items are flowing successfully from all providers.

Smoking status was self-reported. For this reason, there may be a degree of bias from those responding, and the true figures may be higher than recorded within the MSDS. This limitation is similar to that seen in other data collections where data about smoking is also self-reported, and evidence suggests reliance on self-reported smoking status underestimates true smoking by 25% (8). Nearly half (47.6%) of the records had an invalid or missing smoking status, made up of women for whom the smoking status was missing or invalid at booking, the smoking

[1] These statistics are classified as experimental and should be used with caution. Experimental statistics are new official statistics undergoing evaluation. More information about experimental statistics can be found on the UK Statistics Authority website.

status was missing at delivery and the smoking status was missing in both booking and delivery record. For the records where the smoking status was missing at delivery but their status at booking was 'never smoked' assumptions were made that these women would still be classed as 'never smoked' at delivery. Making this assumption meant that more records were able to be included in the analyses, thus increasing the number of records in 2018 to 2019 with a known smoking status.

The source for the analysis is records of babies born, and information about their mother's smoking status. Counts shown, therefore, refer to babies rather than women. The same analysis run on records for individual women may change the counts and percentages slightly, however, it is unlikely to make any change to the conclusions drawn. Where this report describes findings for women, it is specifically counting mothers of babies.

Counts shown are rounded to the nearest 5. For this reason, some of the percentages may not add up to 100% because of rounding. For the purpose of this analysis, percentages have been calculated where the smoking statuses at booking and at delivery were known and valid.

Definitions used in this report

Term	Explanation
Booking appointment	The first appointment with a midwife. This should ideally occur before a woman is 10 weeks pregnant.
Known smoking status	Women who had a valid smoking status recorded at both the booking appointment and at delivery.
Never smoked	Women who have never smoked plus those who said they were a non-smoker (excluding women who had given up smoking before conception) at the booking appointment and who were still non-smokers at delivery.
Ex-smoker (at time of conception)	Women who said they had given up smoking before conception.
Smoker at conception	Women who said they had been a smoker at conception
Stopped smoking in early pregnancy	Women who said they had been a smoker at conception but who had stopped smoking before the booking appointment.
Smoker at booking	Women who said they were smokers at the booking appointment
Stopped smoking in late pregnancy	Women who said they were smokers at the booking appointment but who said they were non-smokers at delivery.
Stopped smoking in pregnancy	Women who stopped smoking in early pregnancy plus women who stopped smoking in late pregnancy.

Term	Explanation
Smoked throughout pregnancy	Women who said they were smokers at the booking appointment and also at delivery.
Resumed smoking	Women who said that they had never smoked or had stopped smoking but said that they were smokers when asked at delivery.
First pregnancy	Women booking who have had no previous live birth, stillbirth, termination or miscarriage before 24 weeks.
Not in employment	Includes the following: • unemployed and seeking work • students who are undertaking full (at least 16 hours per week) or part-time (less than 16 hours per week) education or training and who are not working or actively seeking work • long-term sick or disabled, those who are receiving incapacity benefit, income support or both; or employment and support allowance • homemaker looking after the family or home and who are not working or actively seeking work • not receiving benefits and who are not working or actively seeking work • unpaid voluntary work who are not working or actively seeking work • retired
Subsequent pregnancy	Women who have previously experienced pregnancy. These are the total number of women booking excluding those women identified as having a first pregnancy and those for whom the status is not known for the number of live births, stillbirths, terminations or miscarriages before 24 weeks.
Substance misuse	Misuse of cocaine, crack, heroin, cannabis and new psychoactive substances (NPS). The misuse of medicines such as morphine or other prescribed opioids or solvents such as glue or aerosols are also considered as substance misuse. Tobacco and alcohol are recorded as separate data items and so are not included in the analysis of substance misuse. Prescribed medication is also excluded.
Women with complex social factors	Includes those aged under 20, women who experience domestic abuse, women who are recent migrants, asylum seekers or refugees, or who have difficulty reading or speaking English or women who misuse substances including alcohol (9).

Results

Of the women for whom the smoking status was known (400,430), most women reported that they had never smoked (71.5%) or had given up smoking before conception (ex-smokers) (14.5%). One in 7 women (14.0%) said that they were smokers. A breakdown showing the smoking status at conception and delivery is shown in Table 1.

Table 1. Women with a known smoking status, April 2018 to March 2019

<table>
<tr><td rowspan="8">Women with a known smoking status at both booking appointment and delivery (400,430)</td><td>Status at conception</td><td colspan="2">Status at delivery</td></tr>
<tr><td rowspan="2">Never smoked (286,275, 71.5%)</td><td colspan="2">Started smoking (945, 0.2%)</td></tr>
<tr><td colspan="2">Remained non-smoker (285,330, 71.3%)</td></tr>
<tr><td rowspan="2">Ex-smoker (58,250, 14.5%)</td><td colspan="2">Resumed smoking (1,350, 0.3%)</td></tr>
<tr><td colspan="2">Remained non-smoker (56,900, 14.2%)</td></tr>
<tr><td rowspan="4">Smoker (55,905, 14.0%)</td><td rowspan="2">Stopped smoking in early pregnancy (19,825, 5.0%)</td><td>Remained non-smoker (18,440, 4.6%)</td></tr>
<tr><td>Resumed smoking (1,385, 0.3%)</td></tr>
<tr><td rowspan="2">Smoker at booking (36,080, 9.0%)</td><td>Stopped smoking in late pregnancy (13,090, 3.3%)</td></tr>
<tr><td>Smoked throughout pregnancy (22,990, 5.7%)</td></tr>
</table>

Women who never smoked

When asked about their smoking habits at their booking appointment, 71.5% of women (286,275) said that they had never smoked.

The proportion of women who had never smoked increased with age, ranging from less than half of women aged under 20 (49.7%) compared to more than 75% of women in their 30s (and older) who said that they had never smoked. Women with Asian ethnicity were 1.4 times more likely to have never smoked than women of White ethnicity; 91.0% of women with Asian ethnicity, 86.5% of women with Black ethnicity and 79.4% of women with Other ethnicity had never smoked, compared with 65.6% of women with White ethnicity. Women living in more affluent areas were 1.3 times more likely to have never smoked when compared with women living in the areas of highest deprivation (78.6% compared with 62.7%). The proportion of women who never smoked varied by region, with 83.1% of women living in London saying they had never smoked, compared with 54.0% of women living in the North East.

A higher proportion of women in employment had never smoked (74.4%) compared with women who were not in employment (71.0%). Women recorded without complex social factors (73.7%) were more likely to have never smoked, compared to women recorded with complex social factors (66.8%). Women not misusing substances were more likely to have never smoked (74.5%) compared to women recorded as currently misusing substances (64.0%) or those recorded as previously misusing substances (22.1%). More women who did not drink alcohol had never smoked (71.2%) than those who drank one or more unit of alcohol each week (43.1%).

Higher proportions of women who were pregnant for the first time (77.7%) had never smoked when compared with 71.9% of women booking for a subsequent pregnancy. More women who attended their first maternity appointment late (after 20 weeks) had never smoked (76.0%) compared with 70.4% of those attending within 10 weeks.

Ex-smokers (at time of conception)

Among all women, 14.5% (58,250) said that they were ex-smokers, with the highest proportion in women aged 40 years and above (15.0%) and women of White ethnicity (16.9%). The lowest proportions were seen in women of Asian ethnicity (6.8%). A third of women (33.3%) from the North East and almost a quarter of women (24.7%) from the West Midlands said they were ex-smokers, in comparison to 7.8% of women living in the East Midlands.

More women in employment (13.5%) were ex-smokers, compared with those who were not employed (9.2%). When looking at complex social factors, 14.0% of women recorded without complex social factors were ex-smokers, compared with 10.0% of those recorded with complex social factors. For women who had previously misused substances, 22.7% said that they were ex-smokers compared with 4.1% of current substance misusers. Over a third of women (34.9%) who drank one or more units of alcohol each week said they were ex-smokers, compared with 13.8% of those who did not drink alcohol.

A higher proportion of women who were pregnant for at least the second time were ex-smokers; 10.8% of women who were pregnant for the first time were ex-smokers, compared with 13.6% of those experiencing a subsequent pregnancy. Of the women who saw their midwife within the recommended 10 weeks after conception, 15.3% were ex-smokers, compared with under 13% of those booking after 13 weeks.

Most ex-smokers remained as non-smokers, with 1,350 (2.3% ex-smokers) recorded as smoking at time of delivery. For those women who did resume smoking, the highest proportions were seen in younger women aged under 25 (5.8% ex-smokers aged under 20, 4.4% ex-smokers aged 20 to 24) and women with White ethnicity (2.6% ex-smokers). More deprived areas had higher proportions of women recorded as having resumed smoking (4.1% ex-smokers who lived in the most deprive decile resumed smoking compared with 0.8% in the least

deprived decile). In addition, there was regional variation, with 3.9% ex-smokers from the North West recorded as having resumed smoking, in comparison to 1.4% ex-smokers from the North East.

Ex-smokers not in employment were 3.3 times more likely to resume smoking than those in employment (5.0% compared with 1.5%). Ex-smokers with complex social factors were 2.4 times more likely to resume smoking than those without. One in 5 ex-smokers (21.9%) who were current substance misusers resumed smoking in comparison to one in 50 (2.1%) ex-smokers who were not misusing substances.

Ex-smokers experiencing a subsequent pregnancy (2.8%) were more likely to resume smoking than those pregnant for the first time (1.7%).

Smokers

When asked at their booking appointment, 14.0% (55,905) of women said that they had been smokers at conception. More than half of the women who were smokers at the time of conception had stopped smoking before the birth of their baby. This group includes women who stopped smoking in early pregnancy (after conception but before their booking appointment) plus those who stopped smoking in late pregnancy (after their booking appointment but before delivery). Table 2 shows how the smoking status changed from conception to delivery.

Table 2. Smoking status at booking and delivery, April 2018 to March 2019

Status at conception	Status at booking	Status at delivery
Smoker (55,905)	Stopped smoking in early pregnancy (19,825, 33.5%)	Remained non-smoker (18,440, 33%)
		Resumed smoking (1,385, 2.5%)
	Smoker at booking (36,080, 64.5%)	Stopped smoking in late pregnancy (13,090, 23.4%)
		Smoked throughout pregnancy (22,990, 41.1%)

Women who stopped smoking in early pregnancy

Among smokers at conception, 33.0% said that they had stopped smoking in early pregnancy and then remained a non-smoker to the end of their pregnancy.

A higher proportion of women over 30 stopped smoking in early pregnancy compared with younger women; 37.0% smokers aged 30 to 34 and 37.6% smokers aged 35 to 39 stopped smoking in early pregnancy, compared to 26.0% smokers under 20. The highest proportion of women who stopped smoking in early pregnancy were women with Asian ethnicity (38.5%) and women with Black ethnicity (37.7%).

More women living in the most affluent areas stopped smoking in early pregnancy, with 56.5% of those living in the most affluent areas stopping in early pregnancy, compared with 17.6% of those living in the most deprived areas. More women who lived in the South East region stopped smoking in early pregnancy (45.4%) compared with 10.9% of women in the North East.

Women in employment were twice as likely to stop smoking in early pregnancy compared to those who were not in employment (44.6% and 22.2% respectively). Higher proportions of women recorded without complex social factors stopped smoking in early pregnancy compared with those who were recorded as having complex social factors (34.3% and 22.0% respectively). When comparing the proportion of women by substance misuse status, 33.7% of women who were not using substances stopped smoking in early pregnancy, compared with 28.5% of previous users and 5.9% of current users. A higher proportion of women who did not drink alcohol stopped smoking in early pregnancy (35.0%) than those who drank one or more unit per week (25.7%).

More women for whom this was their first pregnancy stopped smoking in early pregnancy than women for whom this was a subsequent pregnancy (41.9% compared with 26.1%). Women who attended their booking appointment within 10 weeks were also more likely to have stopped smoking in early pregnancy than women who attended after 13 weeks (35.8% and 22.8% respectively).

A small proportion of women who were recorded as having stopped smoking in early pregnancy then resumed smoking before their baby was born (1,385 women or 7.0% of those who had initially stopped smoking). These women were generally younger women: 12.7% of women aged under 20 and 8.8% of women aged 20 to 24. Women living in the areas with the highest deprivation were also more likely than women living in areas of least deprivation to resume smoking (11.6% compared with 4.3%). There were also regional differences; 10.6% of women living in the West Midlands region and 9.7% of women living in the North West resumed smoking.

Higher than average proportions of women who resumed smoking were observed in those who were not employed (12.1%) and those who were recorded as having complex social factors (10.2%). Current and previous substance misusers were more likely to resume smoking (15.0% and 10.6% respectively), as were those women who did not drink alcohol (7.5% compared with 4.8% of those who drank one or more units per week).

Women experiencing a subsequent pregnancy were more likely to resume smoking (8.5%) as well as those booking after 13 completed weeks (8.6%).

Women who stopped smoking in late pregnancy (having been smokers at booking)

At the time of their booking appointment, 9.0% (36,080) of all women were recorded as being smokers and, of these, 36.3% (13,090) stopped smoking before they gave birth.

Women aged under 20 were most likely to be smokers at booking, with 25.3% recorded as smokers, compared with 4.7% of women aged 40 years and above. However, a greater proportion of younger women stopped smoking in late pregnancy, with 38.7% of women under 20 stopping smoking after their booking appointment, compared with 34.8% of women aged over 40 years. Women with White ethnicity were most likely to be smokers at their booking appointment, with 11.5% recorded as smokers, compared with 1.3% of women with Asian ethnicity. In addition, women with Asian ethnicity who were smokers at booking were the most likely to stop smoking in late pregnancy, with 59.4% stopping smoking after their booking appointment, compared with 35.2% of women with White ethnicity. Women living in the most deprived areas were more than 6 times as likely to be smokers at their booking appointment (18.8%) compared with those living in the most affluent (2.9%). In addition, those living in the more affluent areas who were smokers at booking were the most likely to stop smoking in late pregnancy, with 42.3% of women living in the most affluent areas stopping smoking in late pregnancy, compared with 33.4% of women living in the most deprived areas. Women living in Yorkshire and the Humber and the West Midlands were most likely to be smokers at booking: 13.9% in Yorkshire and the Humber, and 13.2% in the West Midlands, compared with 4.4% in London. However, the highest rates of stopping smoking in late pregnancy were in the North East, where almost half of smokers at booking stopped smoking in late pregnancy, compared with 27.5% of those in the East Midlands.

Women not in employment were more likely to be smokers at booking; 14.8%, compared with 6.4% of those in employment. In addition, women in employment were more likely to stop smoking in late pregnancy: 42.0%, compared with 28.7% of those women not in employment who were smokers at booking. Women recorded as having complex social factors were more likely to be smokers at booking; 17.5%, compared with 7.7% of those without. However, women without complex social factors were more likely to stop smoking in late pregnancy; 38.2%, compared with 31.7% of those women recorded as having complex social factors. Levels of smoking at booking were lower among those were not misusing substances; 37.6% of women who had previously misused substances, and 29.7% of those who were currently misusing substances were smokers at booking, compared with 8.2% of those who were not misusing substances. In addition, those not misusing substances were more likely to stop smoking in late pregnancy; 36.6%, compared with 30.1% of women previously misusing substances, and 27.2% of those currently misusing substances. More women who drank one or more units of alcohol per week were smokers at booking than those who did not drink alcohol; 16.1%, compared with 9.3%. However, those who drank one or more units were more likely to stop

smoking in late pregnancy; 50.4% compared with 36.8% of women who were smokers but did not drink at booking.

Women experiencing a subsequent pregnancy were more likely to be smokers at booking than those pregnant for the first time (10.4% compared with 6.4%). In addition, women pregnant for the first time were also more likely to stop smoking in late pregnancy (45.4% compared with 31.7% of those women who were smokers at booking for a subsequent pregnancy).

Women who booked after 13 completed weeks were more likely to smoke: 11.6% compared with 8.8% of those booking within 10 weeks, and 8.3% of those booking between 11 and 13 weeks. In addition, those smokers booking within 10 weeks were most likely to stop smoking in late pregnancy: 38.0% compared with 32.2% of those booking after 13 weeks.

Comparison to published statistics on stop smoking services

When looking at the statistics on NHS Stop Smoking Services in England for April 2018 to March 2019, out of the 13,772 pregnant women who set a quit date, 6,344 (46.1%) successfully stopped smoking at the 4 week follow-up (self-reported), 3,922 (28.5%) did not stop smoking and 3,506 (25.5%) had a smoking status which was not known or were lost to follow-up (a treated smoker is counted as 'lost to follow up' if, on attempting to determine the 4-week quitter status they cannot be contacted).

When comparing this to the 36,080 women who said that they were smoking at booking in the MSDS, 36.3%, (13,090 women) had stopped smoking in late pregnancy. It is not possible to tell from the MSDS data extract if these women had contacted stop smoking services.

Women who smoked throughout pregnancy

From this analysis, 6.7% women were smoking at the time of delivery. This is primarily made up of women who smoked throughout their pregnancy plus those who had previously stopped smoking but had resumed smoking before the birth of their baby.

Characteristics of women who smoked throughout pregnancy

For all women, 9.0% (36,080) were smokers at booking and, of these, 63.7% (22,990) continued to smoke up until they gave birth.

Although women aged under 20 were the most likely of all age groups to be smokers at booking, they were the least likely to continue to smoke at delivery, with 61.3% of smokers at

booking aged under 20 saying that they smoked throughout pregnancy when asked at delivery, compared with 65.2% of smokers at booking aged 40 years and over. When looking at ethnicity, as well as being the most likely to be smokers at booking, women with White ethnicity were also most likely to continue to smoke throughout pregnancy. Women living in the most deprived areas were also more likely to smoke throughout pregnancy (66.6% compared with 57.7% in the least deprived areas). While women living in Yorkshire and the Humber and the West Midlands were most likely to be smokers at booking (13.9% and 13.2% respectively), smokers at booking living in the East Midlands were most likely to still be smokers at delivery (72.5%).

Smokers at booking who were not in employment were more likely to continue to be smokers at delivery (71.3% of smokers at booking who were not in employment, compared with 58.0% of smokers at booking who were in employment). Smokers at booking recorded as having complex social factors were more likely to continue to be smokers at delivery (68.3%, compared with 61.8% of smokers at booking without complex social factors). When looking at those who misuse substances, 72.8% of smokers at booking who also misused substances continued to be smokers at delivery, compared with 63.4% of smokers at booking who did not misuse substances. Smokers at booking who did not drink alcohol were more likely to smoke at delivery than those who drank one or more units of alcohol per week; 63.2% compared with 49.6%.

Smokers at booking experiencing a subsequent pregnancy were more likely to continue to be smokers at delivery than those experiencing their first pregnancy; 68.3% compared with 54.6% of first pregnancies. Smokers at booking who booked late were more likely to continue to be smokers at delivery (72.6% of those booking after 20 weeks, compared with 62.0% of those booking within 10 completed weeks of pregnancy).

Women who smoked throughout pregnancy: cigarettes smoked per day

Further analysis of smoking habits shows that almost half of women who smoked throughout pregnancy (49.8%) said that they smoked fewer than 10 cigarettes per day (light smokers), over a quarter of these women (26.3%) smoked between 10 and 19 cigarettes per day (moderate smokers) and 5.1% were smoking in excess of 20 per day (heavy smokers). For 18.8% of women who smoked throughout pregnancy (4,320), the number of cigarettes smoked was not recorded. There may also be underreporting of the numbers of cigarettes smoked. Heavier smoking was more prevalent in women of older age groups and women living in more deprived areas. The quality of data collection varied considerably between regions; 60.4% of records for women who smoked in the North East did not contain information on the number of cigarettes whereas 6.2% were missing for those women living in the East Midlands. Smokers living in London were more likely to be light smokers, with 63.4% of smokers consuming fewer than 10 cigarettes per day. The women who smoked more heavily (20 cigarettes or more per day) were women from the East Midlands and Yorkshire and the Humber (8.0% and 6.7% respectively).

Comparison to published statistics on women's smoking status at time of delivery

Smoking at time of delivery is an important public health indicator of maternal and child health. The numbers of women smoking at delivery are collected and reported quarterly (the latest figures are for January to March 2021) from clinical commissioning groups (CCGs) and reported annually in the Public Health Outcomes Framework.

The number of women smoking at the time of delivery has steadily decreased for the last few years. In the financial year April 2018 to March 2019, out of 579,995 deliveries with a known smoking status, 10.6% of women (61,399) were known to be smokers at the time of delivery and 2% of women (11,706) had an unknown smoking status. From the MSDS data for the same time period, the proportion of women smoking at delivery was around 6.7% (26,670 women) but the proportion of women for whom the smoking status was not valid[2] was 27.7% (153,305 women). The data within the MSDS at this time relied on self-reporting of smoking status. The introduction of CO monitoring and requirement to report the reading should improve data quality.

[2] Excluding those women for whom the assumption was made that they were still non-smokers (women who said they had never smoked when asked at booking but for whom the status was missing in the delivery record)

Conclusions

Women in their 30s, those of Asian or Black ethnicity and those living in more affluent areas are most likely to stop smoking either in advance of pregnancy or in early pregnancy (in other words, after conception but before their pregnancy booking appointment).

Younger mothers (aged under 20) were more likely to have stopped smoking in late pregnancy, suggesting that this age group may not have been aware of the risks around smoking in pregnancy but responded well to public health messages and when offered help from stop smoking services.

Women of White ethnicity and women living in more deprived areas were more likely to have smoked throughout pregnancy. Those not in employment, with complex social factors, and those currently misusing or who had previously misused substances are more likely to smoke and less likely to stop successfully, and therefore more likely to smoke at delivery. Women who were experiencing a subsequent pregnancy were also more likely to have smoked throughout pregnancy than women for whom this was their first pregnancy. Tailoring both messaging around the importance of stopping smoking and providing targeted interventions to help these specific cohorts of women may help to ensure more women and their partners are supported to become and stay smoke-free.

Overall, the characteristics of women who stop smoking during pregnancy (either in early or late pregnancy) were similar to the characteristics of women who never smoke. The exceptions to this were women under 20 who were the most likely age group to be smokers at booking but the least likely to have smoked throughout pregnancy. In addition, there were also some notable differences at regional level with regards to the proportion of women who stopped smoking and the point at which they did so. Differences at a regional level may be associated with the localised distribution of risk factors among pregnant women, responsiveness to national and local health promotion campaigns and variability in the services provided.

References

1. NHS action on prevention: smoking
2. Royal College of Physicians of London Tobacco Advisory Group. 'Hiding in plain sight: treating tobacco dependency in the NHS.' Royal College of Physicians of London (RCP) 2018
3. NHS England. 'Better births: Improving outcomes of maternity services in England: a 5-year forward view for maternity care.' London 2016
4. NHS England. 'Saving babies' lives version 2. A care bundle for reducing perinatal mortality.' London 2019
5. NHS long-term plan, chapter 2, Smoking. 2019
6. National Institute for Health and Care Excellence. 'Public health guideline [PH26]' 2010
7. Public Health England. 'Maternity high impact area: Supporting parents to have a smoke-free pregnancy. 2020
8. Shipton D, Tappin D M, Vadiveloo T, Crossley J A, Aitken D A, Chalmers J and others. 'Reliability of self-reported smoking status by pregnant women for estimating smoking prevalence: a retrospective, cross sectional study.' British Medical Journal 2009: volume 339, issue b4347. doi:10.1136/bmj.b4347
9. National Institute for Health and Care Excellence. 'Clinical guideline [CG110].' 2010

About Public Health England

Public Health England exists to protect and improve the nation's health and wellbeing, and reduce health inequalities. We do this through world-leading science, research, knowledge and intelligence, advocacy, partnerships and the delivery of specialist public health services. We are an executive agency of the Department of Health and Social Care, and a distinct delivery organisation with operational autonomy. We provide government, local government, the NHS, Parliament, industry and the public with evidence-based professional, scientific and delivery expertise and support.

Public Health England
Wellington House
133-155 Waterloo Road
London SE1 8UG
Tel: 020 7654 8000

Website: www.gov.uk/phe
Twitter: @PHE_uk
Facebook: www.facebook.com/PublicHealthEngland

For queries relating to this document, please contact: chimat@phe.gov.uk

Published: September 2021
PHE gateway number: GOV-9772

PHE supports the UN Sustainable Development Goals