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Information Centre

Statistics on Women's Smoking Status at Time of Delivery: England

April 2015 to March 2016

Published 16 June 2016



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This report may be of interest to members of the public, policy officials and other stakeholders to make local and national comparisons and to monitor the quality and effectiveness of stop smoking services for pregnant women.

Author: Lifestyles Statistics Team,
Health and Social Care Information Centre

Responsible statistician: Paul Niblett, Section Head

Version: V1.0

Date of publication: 16 June 2016

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Key Facts

In England, 1 April 2015 to 31 March 2016:

- In 2015/16, 10.6 per cent of mothers were recorded as smokers at the time of delivery which is lower than 2014/15 (11.4%). This continues the steady year-on-year decline in the percentage of women smoking at the time of delivery from 15.1 per cent in 2006/07.
- This is the first time national annual figures have been below the 11 per cent target. [Figure 1.](#)
- However, there are some geographical differences amongst all NHS England Regions¹, smoking prevalence at delivery varied from 16.0 per cent in Cumbria and North East to 4.9 per cent in London.
- Of the four Commissioning Regions, London had all 32 of its CCGs meeting the national ambition by the end of March 2016; South of England had 30 of its 50 CCGs doing so; Midlands and East of England had 26 of its 61 CCGs and the North of England 15 of its 66 CCGs.
- Amongst the 209 Clinical Commissioning Groups, smoking prevalence at delivery ranged from 26.0 per cent in NHS Blackpool to 1.5 per cent in NHS Central London (Westminster). [Figure 3.](#)
- Smoking status is unknown for some maternities and therefore caution should be used when making comparisons with earlier periods and between CCGs. At a national level, 3.1 per cent of maternities² had an unknown smoking status in 2015/16. This compares to 3.0 per cent for 2014/15, and 1.4 per cent in 2013/14. This should be borne in mind when interpreting the proportion of pregnant women known to be smoking at the time of delivery as the unknowns are effectively treated as non-smokers in the calculation.
- The proportion of unknowns at CCG level is more evident and exceeded 10 per cent in 15 CCGs in 2015/16. The proportion of women smoking at the time of delivery should be viewed with caution for these CCGs. More information can be found in section 2 and in the Data Quality Statement which accompanies this report.

^a From 1st April 2015 the structure of NHS England has changed and Area Teams have now been integrated into the existing regional structures to form a single regional tier. More information can be found here <http://www.england.nhs.uk/about/regional-area-teams/>

² The number of maternities is defined as the number of pregnant women who give birth to one or more live or stillborn babies of at least 24 weeks gestation, where the baby is delivered by either a midwife or doctor at home or in an NHS hospital (including GP units). This count should be the number of pregnant women, not the number of babies (deliveries). It does not include maternities that occur in psychiatric hospitals or private beds / hospitals.

1 Introduction

Smoking during pregnancy can cause serious pregnancy-related health problems. These include complications during labour and an increased risk of miscarriage, premature birth, still birth, low birth-weight and sudden unexpected death in infancy¹.

Reducing smoking during pregnancy is one of the three national ambitions in the Tobacco Control Plan published in March 2011, which is “to reduce rates of smoking throughout pregnancy to 11 per cent or less by the end of 2015 (measured at time of giving birth)”².

This data collection is designed to provide a measure of the prevalence of smoking among women at the time of giving birth at a local level.

All changes mentioned in this report as being higher or lower have been calculated to be statistically significant differences using the methodology outlined in appendix B.

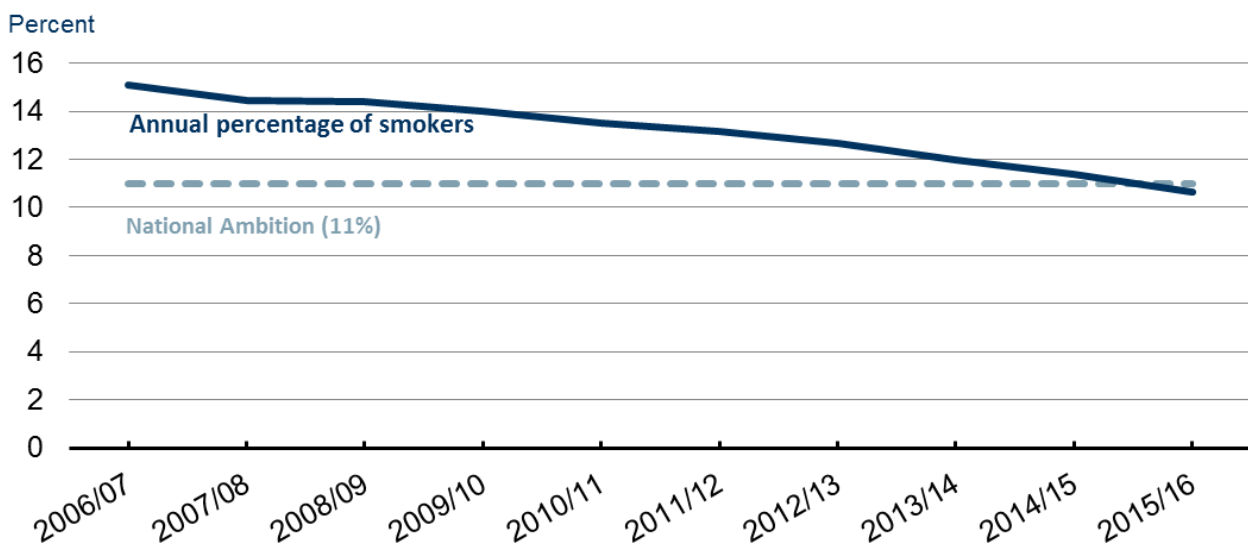
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2 National outcomes

The number of maternities³ in 2015/16 was 631,225. Of these 10.6 per cent of women were recorded as smokers at the time of delivery compared to 11.4 per cent of the 622,643 maternities in 2014/15. This is the first time national annual figures have achieved the 11 per cent target.

In 2006/07 this proportion was 15.1 per cent, since then there has been a steady decline in the percentage of women smoking at the time of delivery [Figure 1](#).

Figure 1 - Prevalence of women giving birth who classed themselves as smokers at the time in England 2006/07 to 2015/16



Source: Health and Social Care Information Centre, Lifestyles Statistics.
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Over the last nine years the number of maternities has risen by 5 per cent from 601,262 to 631,225, whilst the number of smokers at the time of delivery has fallen 26 per cent from 90,887 to 67,195.

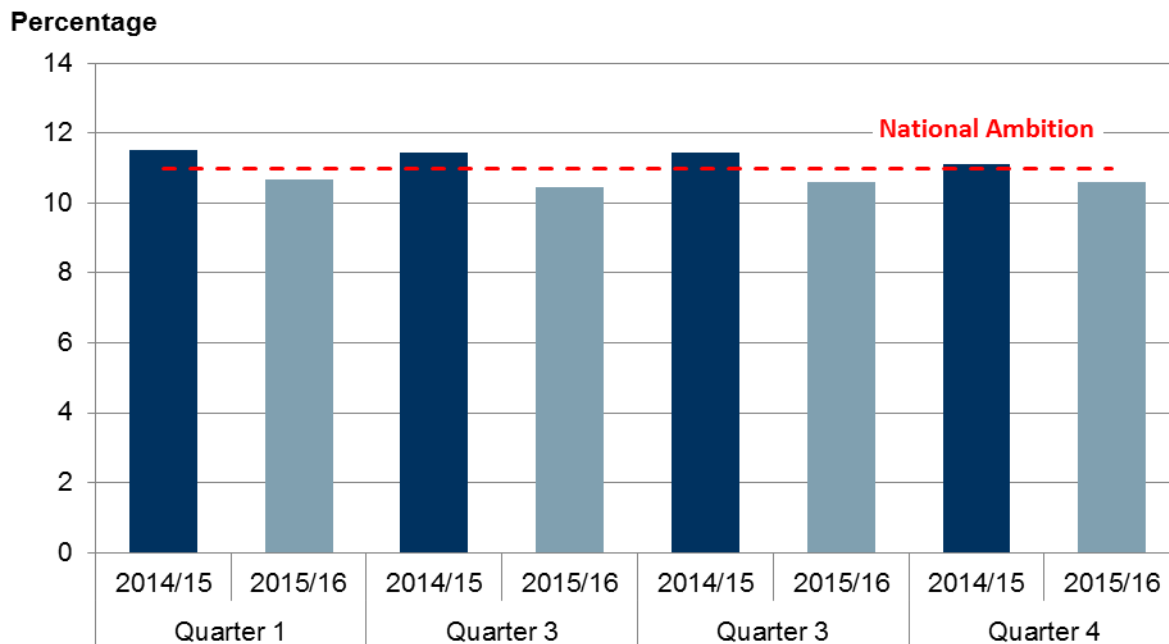
For the year 2015/2016, of the 209 CCGs

- 103 (49%) met the national ambition of 11 per cent or less women smoking at the time of delivery
- 17 (8%) were within 1 percentage point of the ambition, i.e. between 11 and 12 per cent.
- 82 (39%) had recorded more than 12 per cent but less than 20 per cent of pregnant women smoking at the time of delivery
- 7 (3%) had recorded at least 20 per cent of pregnant women smoking at the time of delivery

³ The number of maternities is defined as the number of pregnant women who give birth to one or more live or stillborn babies of at least 24 weeks gestation, where the baby is delivered by either a midwife or doctor at home or in an NHS hospital (including GP units). This count should be the number of pregnant women, not the number of babies (deliveries). It does not include maternities that occur in psychiatric hospitals or private beds / hospitals.

Quarterly data for the year 2015/16 shows that the national ambition of 11 per cent has been achieved in each quarter. [Figure 2](#).

Figure 2 - Prevalence of women giving birth who classed themselves as smokers at the time, England, 2014/15 and 2015/16, by quarter



Source: Health and Social Care Information Centre, Lifestyles Statistics.
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Data Quality Issues

There has been a slight increase in the number of maternities with an unknown smoking status from 3.0 per cent nationally in 2014/15, to 3.1 per cent in 2015/16.

At the moment, these are included in the calculation of the proportion of women smoking at the time of delivery which is the equivalent of treating all these maternities as if the woman was a non-smoker. If these unknowns were removed from the calculation the proportion of smokers would increase from 10.6 per cent to 11.0 per cent. Although this would still show a clear downward trend compared to 2014/15, as conducting the same exercise would change the proportion in 2014/15 from 11.4 per cent to 11.7 per cent.

This would impact the previously stated figures for the year 2015/16 for the 209 CCGs:

- 95 (45%) would meet the national ambition of 11 per cent or less smoking at the time of delivery.
- 14 (7%) would be within 1 percentage point of the ambition, i.e. between 11 and 12 per cent.
- 93 (44%) would have more than 12 per cent but less than 20 per cent of pregnant women smoking at the time of delivery.
- 7 (3%) would have greater than 20 per cent of mothers recorded as smokers at the time of delivery.

This change would have most affect for areas with a high proportion of women with an unknown smoking status. CCGs particularly affected in 2014/15 (with more than 10 per cent

of maternities where the smoking status was unknown) were NHS Ipswich and East Suffolk (59.7%), NHS South West Lincolnshire (28.9%), NHS Herefordshire (28.3%), NHS Solihull (25.9%), NHS Lincolnshire West (25.0%), NHS Lincolnshire East (24.7%), NHS Birmingham CrossCity (20.9%), NHS West Suffolk (20.6%), NHS West Lancashire (17.2%), NHS Cambridgeshire and Peterborough (16.5%), NHS Wirral (15.9%), NHS Southport and Formby (14.8%), NHS South East Staffs and Seisdon and Peninsular (12.2%), NHS Walsall (11.2%) and NHS South Lincolnshire (10.9%).

It's worth noting that the proportion of unknowns has decreased during 2015/16 from a peak of 4.5 per cent in Q1 to 2.2 per cent in Q4.

From April 2017, the definition will change to exclude the unknowns from the denominator when calculating the proportion of women smoking at the time of delivery. Therefore the indicator will be published under both definitions during 2016/17 to allow time to work with CCGs to improve the quality of this data, and to co-ordinate the change with the publication of the new Government tobacco control plan for England which is expected later in 2016. This will also allow CCGs to assess what the impact will be of switching to the new definition. More information is available in the Government response to the consultation on the Public Health Outcomes Framework (PHOF)³.

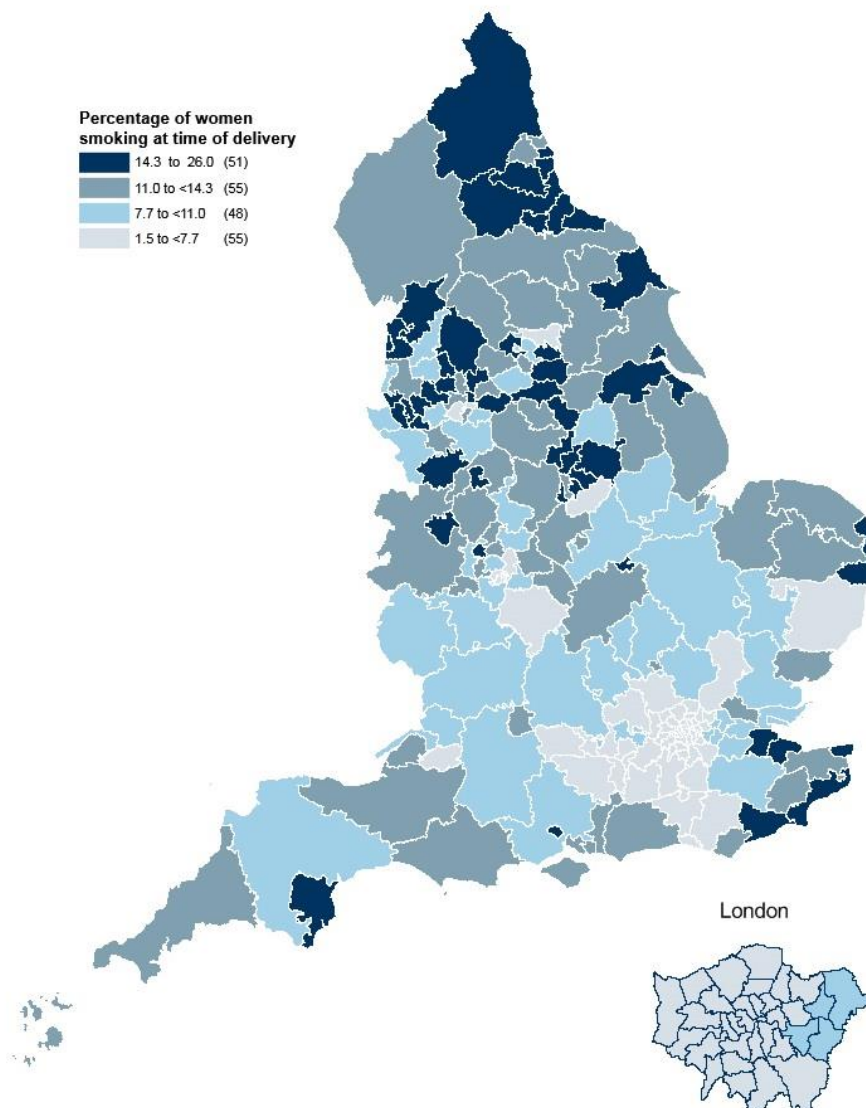
3 Geographical patterns

The geographical distribution by CCG of women smoking at the time of delivery shows a regional difference. This varied from 1.5 per cent in NHS Central London (Westminster) to 26.0 per cent in NHS Blackpool, and amongst the Area teams from 4.9 per cent in London to 16.0 per cent in Cumbria and North East.

Of the four Commissioning Regions, London had all 32 of its CCGs; South of England had 30 of its 50 CCGs; Midlands and East of England had 26 of its 61 CCGs and the North of England 15 of its 66 CCGs meeting the national ambition by the end of March 2016.

Figure 3:

Women known to be smoking at time of delivery by Clinical Commissioning Group in England, Annual 2015/16



Data source: ONS Boundary Files 2015
Ordnance Survey License Number 1000444406

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Appendix A

Definitions for Statistics on Women's Smoking Status at the time of delivery

CCGs are requested to submit the following data items each quarter:

- **Number of maternities** is defined as the number of pregnant women who give birth to one or more live or stillborn babies of at least 24 weeks gestation, where the baby is delivered by either a midwife or doctor at home or in an NHS hospital (including GP units). This count is the number of pregnant women, not the number of babies (deliveries). It does not include maternities that occur in psychiatric hospitals or private beds / hospitals.
- **Number of women known to be smokers at the time of delivery** is defined as the number of pregnant women who reported that they were smokers at the time of giving birth.
- **Number of women known to be non-smokers at the time of delivery** is defined as pregnant women who reported that they were not smokers at the time of giving birth. This count does not include women whose smoking status is not known (which is collected separately).
- **Number of women whose smoking status was not known at the time of delivery** are defined as those whose smoking status was not determined at the time of giving birth.

Calculations

Percentage of mothers known to be smokers at the time of delivery:

$100 \times (\text{Number of mothers known to be smokers at the time of delivery} / \text{Number of maternities})$

Percentage of mothers known to be non-smokers at the time of delivery:

$100 \times (\text{Number of mothers known to be non-smokers at the time of delivery} / \text{Number of maternities})$

Percentage of mothers whose smoking status was not known at the time of delivery:

$100 \times (\text{Number of mothers whose smoking status was not known at the time of delivery} / \text{Number of maternities})$

NOTE: The percentage of maternities where the smoking status was not recorded will result in the under reporting of the percentages of recorded smokers and non-smokers, this should be taken into account when interpreting these data.

Appendix B

Confidence Intervals

A confidence interval gives an indication of the likely error around an estimate that has been calculated from measurements based on a sample of the population. It indicates the range within which the true value for the population as a whole can be expected to lie, taking natural random variation into account.

Throughout this report, 95 per cent confidence intervals are used. These are known as such because if it were possible to repeat the same programme under the same conditions several times, we would expect 95 per cent of the confidence intervals calculated in this way to contain the true population value for that estimate.

This approach is consistent with that used throughout the public health community. For example, census, mortality and hospital admission data represent a 100 per cent sample as does the data for this publication.

Please also note that raw confidence limits do not reflect error due to issues such as data quality and low response rates and these may also need to be considered when interpreting data.

The significance of the difference between two rates or proportions has been carried out throughout this report using the approach outlined below.

Calculate 95 per cent confidence intervals using the method described by Wilson⁴ and Newcombe⁵

Calculate the proportions of women with and without the feature of interest (e.g. percentage of maternities who smoke at the time of delivery).

r = recorded number of maternities that smoke at the time of delivery for the designated time period

n = sample size

p = (r / n) proportion with feature of interest

q = (1 - p) proportion without feature of interest

z = appropriate value $z_{1-\alpha/2}$ from the standard Normal distribution

Calculate three values (A, B and C) as follows:

$$A = 2r + z^2$$

$$B = z \sqrt{z^2 + 4rq}$$

$$C = 2(n + z^2)$$

Then the confidence interval for the population proportion is given by $(A - B)/C$ to $(A + B)/C$

This method has advantages to other approaches as it can be used for any data.

When there are no observed events, r and hence p are both zero, and the recommended confidence interval simplifies to 0 to $z^2 / (n + z^2)$.

When $r = n$ so that $p = 1$, the interval becomes $n / (n + z^2)$ to 1.

Significance Testing

The steps for the approach outlined by Altman et al. are:

Calculate the absolute difference between the two proportions, $\hat{D} = \hat{p}_2 - \hat{p}_1$

Then calculate the confidence limits around \hat{D} as:

$$\hat{D} - \sqrt{(\hat{p}_2 - l_2)^2 + (u_1 - \hat{p}_1)^2} \quad \text{to} \quad \hat{D} + \sqrt{(\hat{p}_1 - l_1)^2 + (u_2 - \hat{p}_2)^2}$$

where \hat{p}_i is the estimated prevalence for year i , and l_i and u_i are the lower and upper confidence intervals for \hat{p}_i respectively.

A significant difference exists between proportions \hat{p}_1 and \hat{p}_2 if and only if zero is not included in the range covered by the confidence limits around the difference \hat{D} .

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**Published by the Health and Social Care Information Centre
Part of the Government Statistical Service**

Responsible Statistician

Paul Niblett, Section Head

ISBN 978-1-78386-729-5

This publication may be requested in large print or other formats.

For further information

www.hscic.gov.uk

0300 303 5678

enquiries@hscic.gov.uk

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