



Office for Health  
Improvement  
& Disparities

# Smoking in pregnancy in Yorkshire and the Humber

**What do we know about the prevalence of smoking in pregnancy in the region, associated health outcomes and how might inequalities impact on these?**

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LKISNorthEastandYorkshire@phe.gov.uk

# Introduction

This briefing provides a summary of:

- Latest available data on smoking in pregnancy and at the time of delivery in the region
- Health outcomes associated with smoking in pregnancy in the region
- Health inequalities associated with smoking in pregnancy in England
- Key findings from [Characteristics of women who stop smoking in pregnancy: Experimental analysis of smoking data](#) report

The briefing is a part of a programme of focused regional summaries looking into specific health improvement topics, produced by [LKIS NEY](#) for both North East and Yorkshire and the Humber. These briefings and 'data bites' are made available via [PHINE Knowledge hub](#) and [C-WorkS resources](#)



# Why focus on smoking in pregnancy?



- Much progress has been made in the last decade, and regional inequalities have considerably narrowed. Yorkshire and the Humber, however, currently has the second highest regional rate of smoking at the time of delivery, **13.1%**, significantly worse than the England average, **9.6%** in the latest financial year.
- Research shows that babies of smokers are at an increased risk of stillbirth, being born prematurely (before 37 weeks), sudden infant death (SIDS) and are, on average, 200g lighter than other babies, which can cause problems during and after labour. For example, they are more likely to have problems keeping warm and are more likely to get infections. **Exposure to second-hand smoke during pregnancy carries much of the same risks.**
- Mothers who smoke are also at an increased risk of developing smoking related conditions such as COPD, heart disease and cancer.
- Infants whose parents smoke (first hand or second-hand) are more likely to be admitted to hospital for bronchitis and pneumonia during their first year and are more likely to suffer from asthma that may need hospital treatment in later childhood. Children whose mothers smoke are also more likely to smoke themselves later in life.

Source: [Stop smoking in pregnancy - NHS \(www.nhs.uk\)](http://www.nhs.uk)

# Latest evidence on smoking in pregnancy

A recent report [Characteristics of women who stop smoking in pregnancy: Experimental analysis of smoking data](#), published by Public Health England in September 2021, examined the characteristics of women who reported that they stopped smoking during pregnancy. The report analysed self-reported smoking status data from all maternity services in England for the financial year April 2018 to March 2019 for babies born to women who were resident in England.

The analysis investigated the potential causes of inequalities for those women who smoke at the time of delivery by breaking data down by demographic, socioeconomic, social complexity and lifestyle factors.

The findings from this report can be used to update population-level intelligence on smoking during pregnancy and may help to inform smoking cessation campaigns and services for women planning to get pregnant and expectant women.

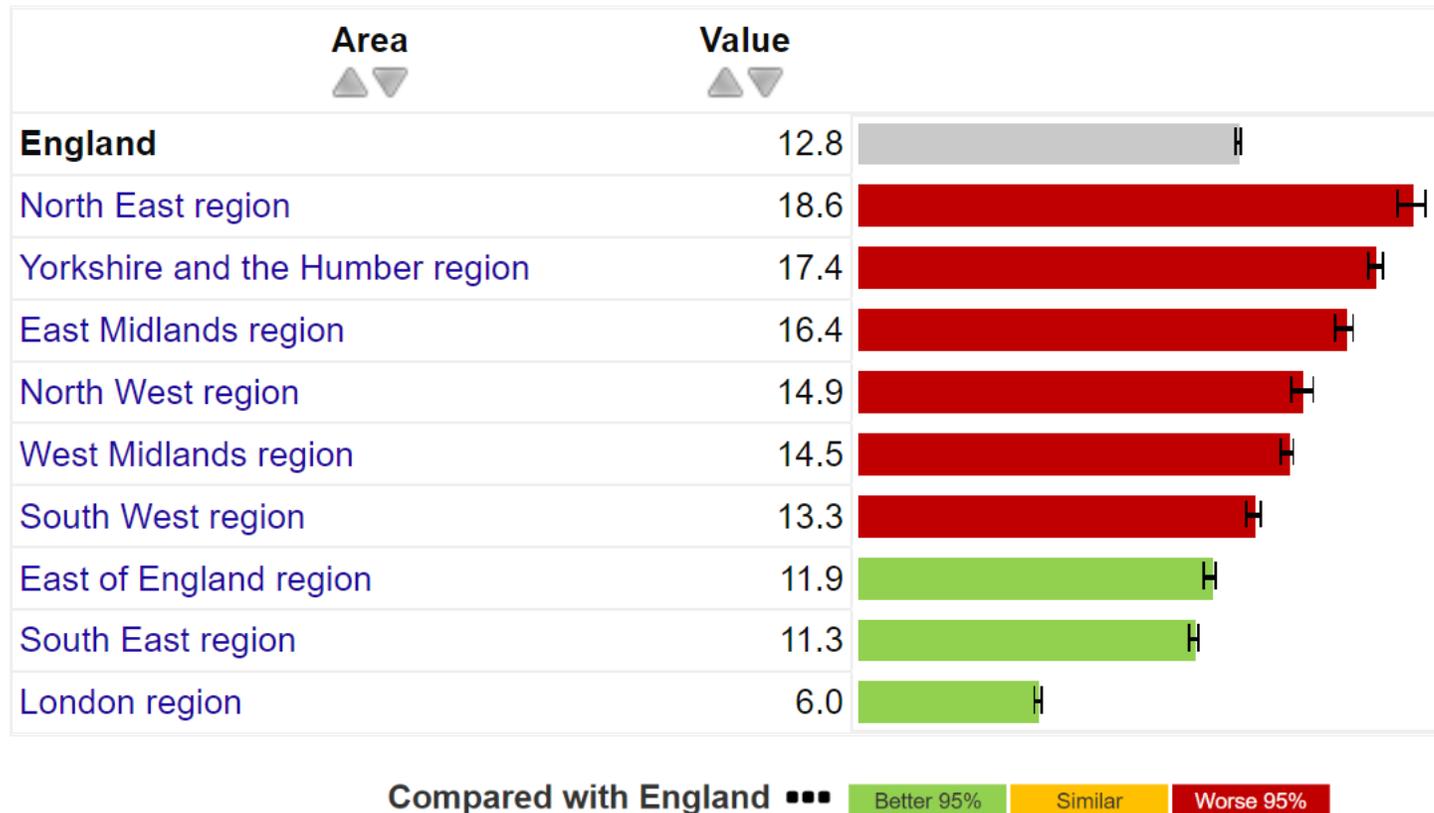
Smoking in pregnancy prevalence data, from [Fingertips Public Health Profiles](#), currently includes both smoking in early pregnancy data and smoking at the time of delivery.



# **Regional overview**

# Smoking in early pregnancy: A regional comparison

Smoking in early pregnancy by region and England, 2018/19. Proportion (%)

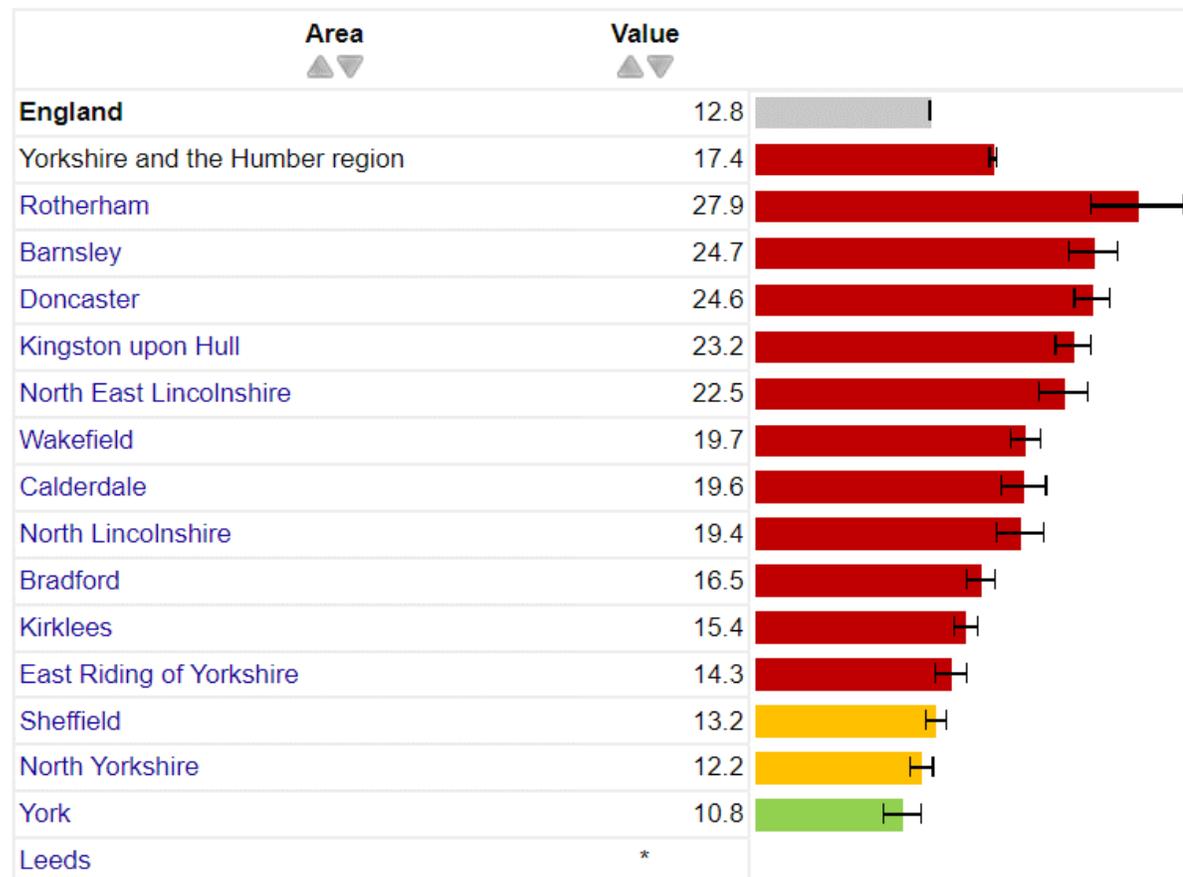


- The Yorkshire and the Humber region has the second highest prevalence of smoking in early pregnancy - 17.4%, which represents 6,321 women. This proportion is significantly worse than the national average, at 12.8%.

Source: Maternity Services Dataset (MSDS) v1.5 via [Public Health Profiles: Child and maternal health](#). 2021 © Crown copyright 2021

# Smoking in early pregnancy by local authority

Smoking in early pregnancy by local authority, Y & H region and England, 2018/19. Proportion (%)



- Rotherham has the highest proportion of smoking in early pregnancy of all local authorities in the region, at 27.9%
- Only York has a prevalence lower than the England average for smoking in early pregnancy, at 10.8%.
- With the exception of Sheffield and North Yorkshire where prevalence is similar to the national average, all other local authorities in the region have a worse prevalence than the England average.

Source: Maternity Services Dataset (MSDS) v1.5 via [Public Health Profiles: Child and Maternal health](#). 2021 ©

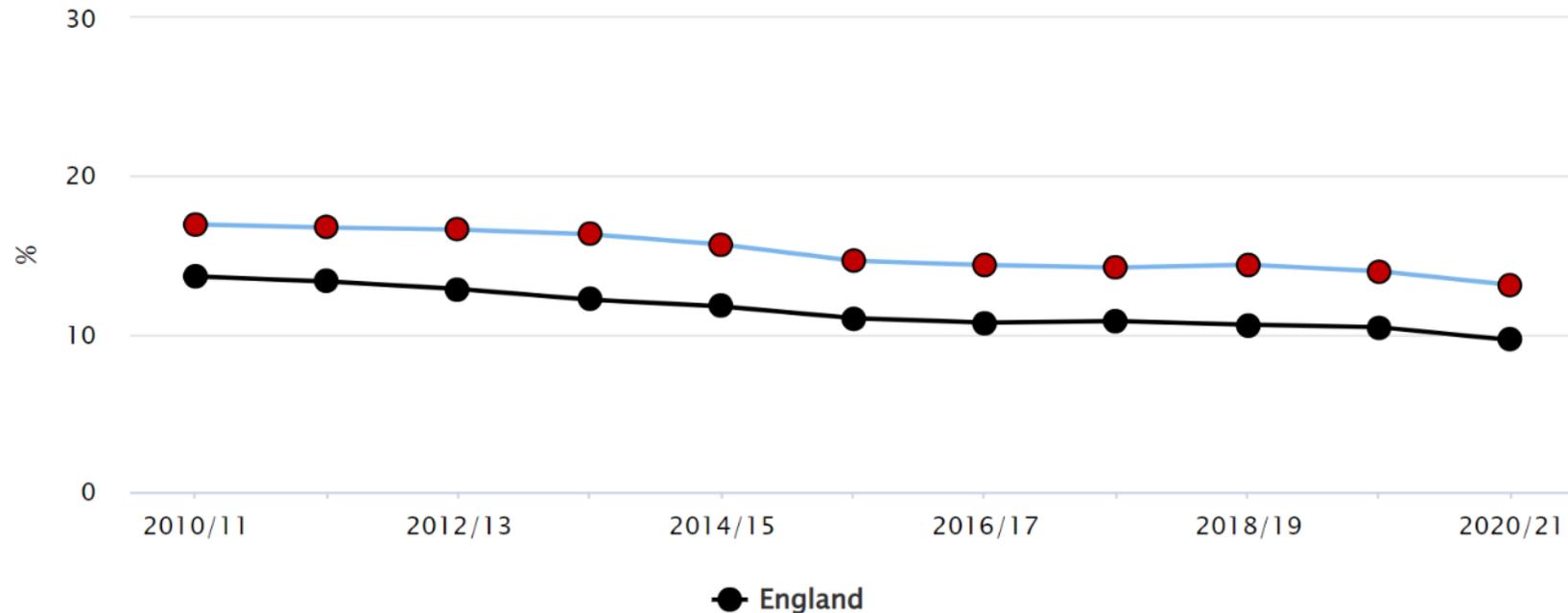
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# Yorkshire and the Humber trend for smoking at the time of delivery

Smoking status at time of delivery 2010/11-2020/21. Y & H region and England. Proportion (%)



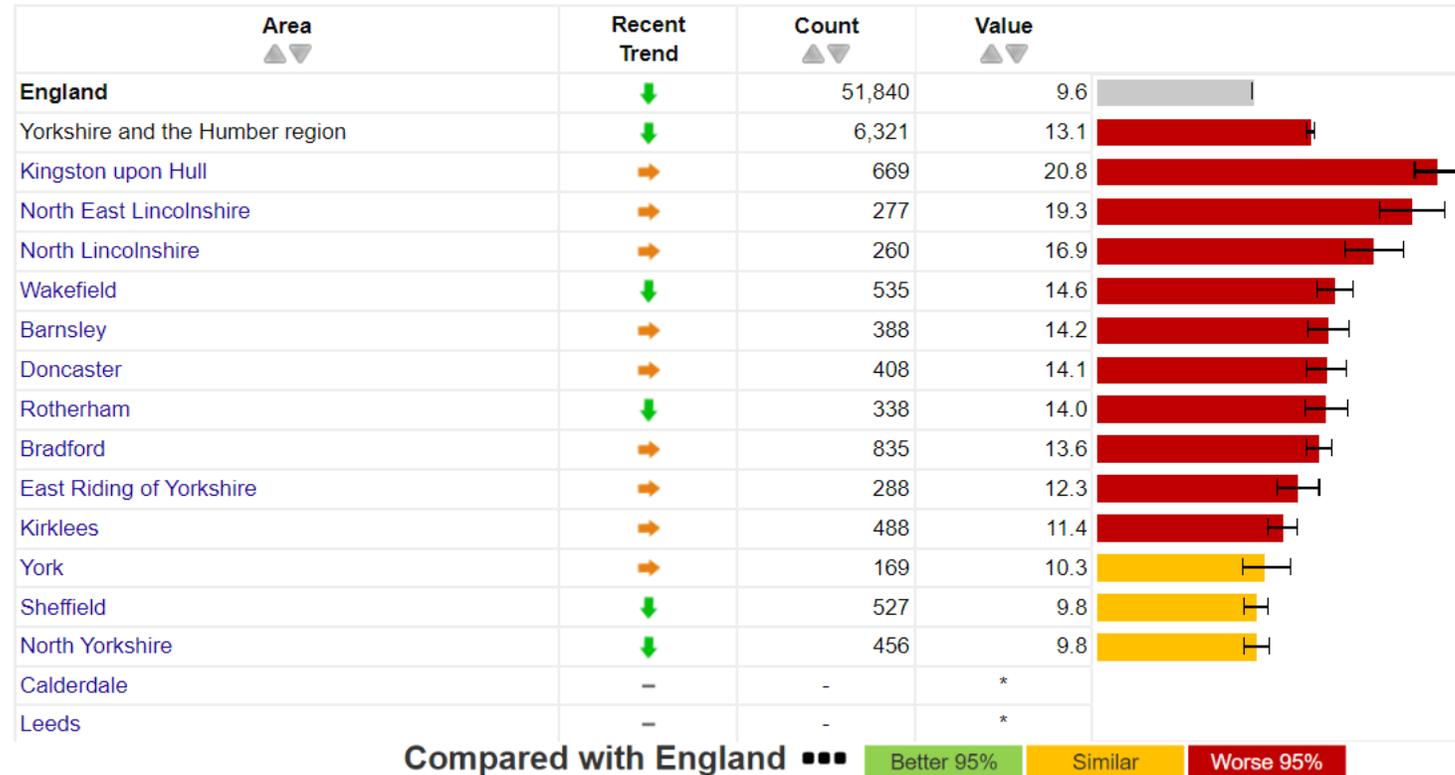
- The prevalence of smoking at the time of delivery has been gradually declining at both a regional (red points) and national level for the past 10 years.
- The region however, remains significantly higher (**13.1%**) than the national average (**9.6%**).

Source: Calculated by PHE from the NHS Digital return on Smoking Status At Time of delivery (SATOD). Available via OHID [Public Health Profiles: Child and Maternal health](#). 2021



# Yorkshire and Humber local authority comparison for smoking at the time of delivery

Smoking status at time of delivery 2020/21. Y & H local authorities. Proportion (%)

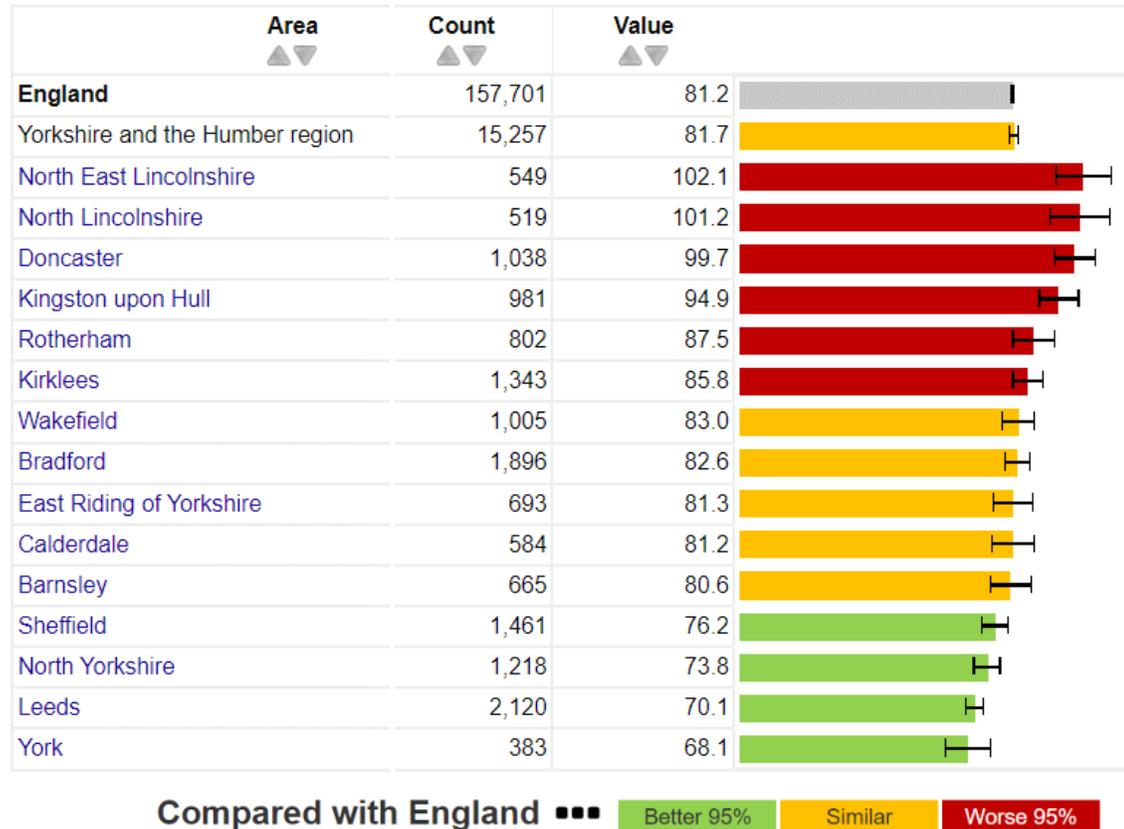


- Kingston upon Hull has the highest proportion of smoking at the time of delivery in the region at just over **1 in 5** women, followed by North East Lincolnshire and North Lincolnshire.
- The proportion is similar to the England average in York, Sheffield and North Yorkshire (data of insufficient quality in Calderdale and Leeds)

Source: Calculated by PHE from the NHS Digital return on Smoking Status At Time of delivery (SATOD). Available via OHID [Public Health Profiles: Child and Maternal health](#). 2021

# Outcomes associated with smoking: Premature births

Premature births (less than 37 weeks gestation) by LA and England, 2016-18. Crude rate (per 1,000)

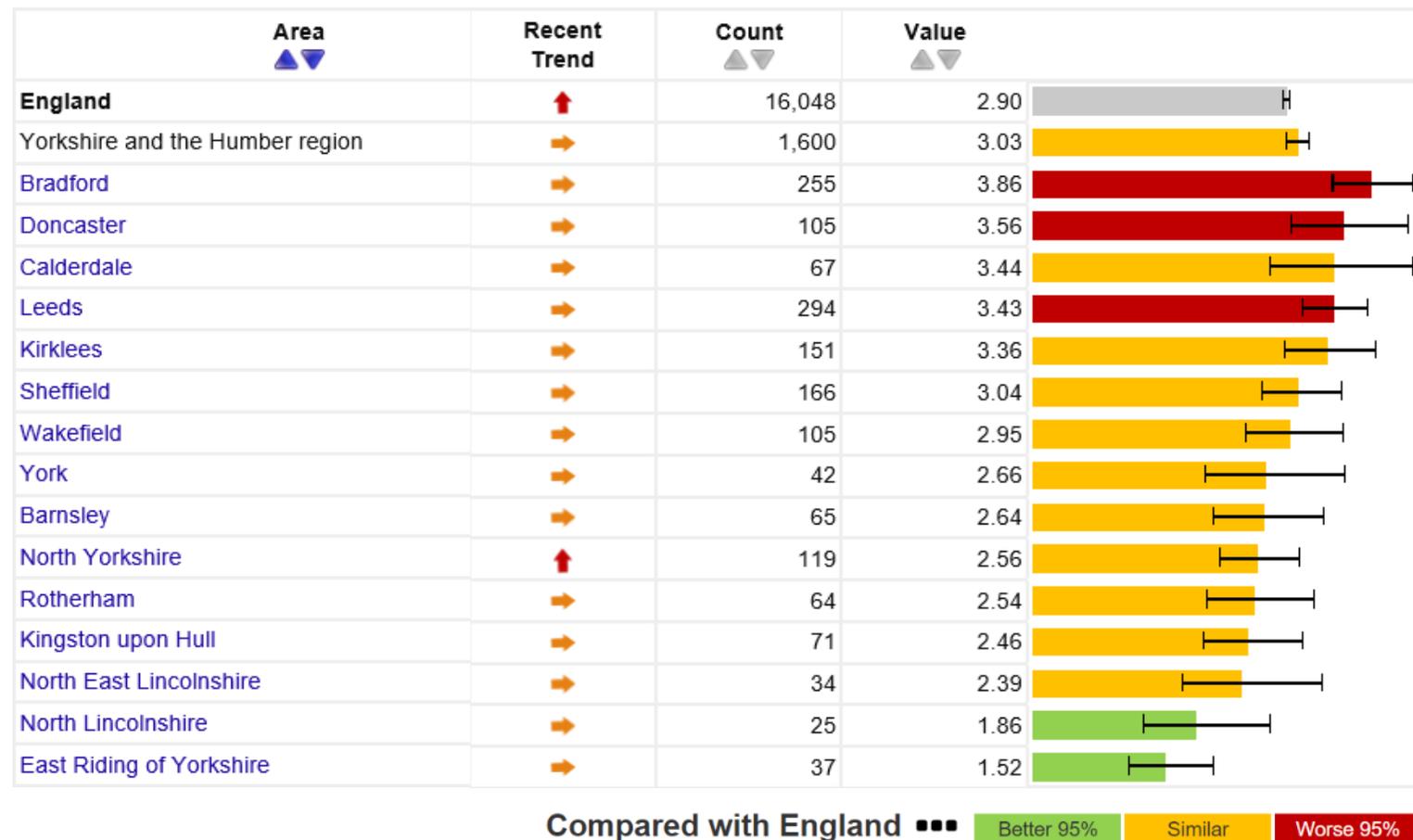


- 2016-18 pooled data shows that the Yorkshire and the Humber region had a similar rate of premature births (under 37 weeks) to the national average at **81.7** per 1,000 compared to England's **81.2** per 1,000.
- Six local authorities in the region have a higher rate of premature births than the England average: North East Lincolnshire, North Lincolnshire, Doncaster, Kingston upon Hull, Rotherham and Kirklees

Source: ONS. available via OHID [Public Health Profiles: Child and Maternal health](#). 2021

# Outcomes associated with smoking: Low birth weight of term babies

Low birth weight of term babies 2019. Yorkshire and the Humber local authorities. Proportion (%)



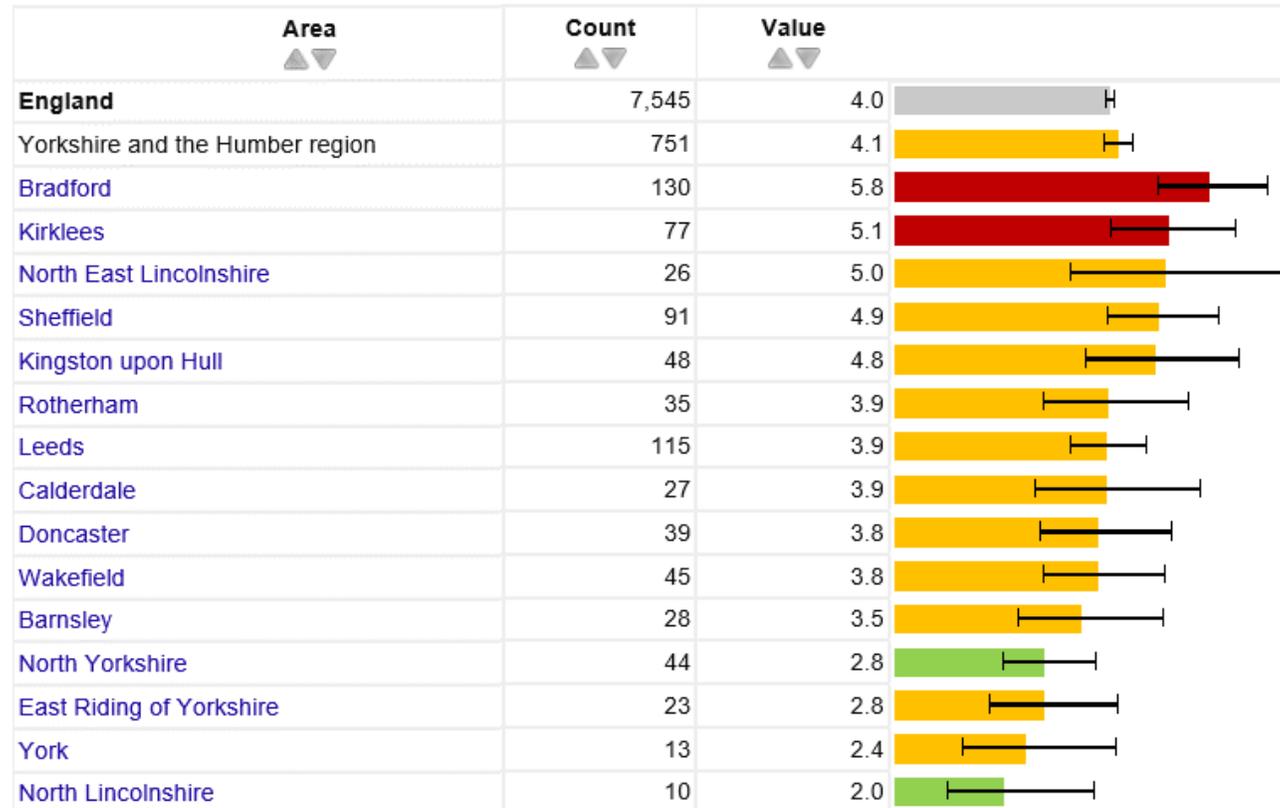
- The regional prevalence of low birth weight term babies, is **3.0%**, similar to the England average (**2.9%**).
- Significantly worse prevalence of low birth weight babies than the England average are in; Bradford (3.9%), Doncaster (3.6%) and Leeds (3.4%). Calderdale has a prevalence of 3.4% but the difference is not statistically significant due to the small sample, ie. lower number of births in the area.
- Recent (5 year) trend data suggests that North Yorkshire, has seen a significant increase in prevalence of low birth weight term babies.

Source: ONS, available via OHID [Public Health Profiles: Child and Maternal health](#). 2021



# Outcomes associated with smoking: still birth rate

Still birth rate 2017-19. Yorkshire and the Humber Local Authorities. Crude rate (per 1,000)



Compared with England ■■■ Better 95% Similar Worse 95%

- The stillbirth rate in the region is similar to the England average, at 4.1 and 4 per 1,000 respectively.
- Two local authorities within the region have a worse still birth rate than the England average (4 per 1,000): Bradford (5.8 per 1,000) and Kirklees (5.1 per 1,000).

Source: ONS available via OHID [Public Health Profiles: Child and Maternal health](#). 2021

# Outcomes associated with smoking: infant mortality rate

Infant mortality rate 2018-20. Yorkshire and the Humber Local Authorities. Crude rate (per 1,000)

Area	Count	Value	
England	7,111	3.9	
Yorkshire and the Humber region	733	4.2	
Bradford	127	6.0	
Kirklees	82	5.6	
Doncaster	47	4.6	
Leeds	128	4.6	
Rotherham	36	4.2	
Kingston upon Hull	40	4.2	
North East Lincolnshire	20	4.0	
Barnsley	30	3.8	
Sheffield	62	3.5	
York	18	3.5	
Calderdale	22	3.4	
Wakefield	39	3.3	
East Riding of Yorkshire	24	3.0	
North Yorkshire	45	2.9	
North Lincolnshire	13	2.7	

- The infant mortality rate in the region (**4.2 per 1,000 births**) is significantly higher than the national average (**3.9**), a regional prevalence which represents 733 deaths occurring during the first 28 days of life (the neonatal period) during 2018-20.
- When broken down by local authorities, two local authorities (Kirklees and Bradford) have a significantly higher rate of infant mortality than the national average (6.2 per 1,000 and 6.1 per 1,000 respectively, and significantly worse than the regional average)

Compared with England ■■■ Better 95% Similar Worse 95%

Source: ONS. Available via OHID [Public Health Profiles: Child and Maternal health](#). 2021

# Regional summary



- Prevalence**
- The region has a worse prevalence of **smoking in early pregnancy (17.4%)** than the national average, **12.8%**, and Rotherham has the highest prevalence of all local authorities in the region, at **27.9%**.
  - For **smoking at the time of delivery**, the region ranks second highest with **13.1%**, after North East and significantly worse than the England average, 9.6%. Kingston upon Hull has the highest rate of smoking at the time of delivery in the region and the second highest nationally at 20.8%, followed by North East Lincolnshire at **19.3%**.
  - The trend data suggests that the prevalence of **smoking at the time of delivery has decreased** over the last 10 years at both a national and regional level.
- Associated health outcomes**
- The Yorkshire and the Humber region has a **similar rate of premature deliveries** (under 37 weeks) to the national average at **81.7 per 1,000** compared to England's 81.2 per 1,000.
  - The regional prevalence of **low birth weight term babies, is 3.0%, similar to the England average**
  - Significantly worse than the England average prevalence of low birth weight babies, are in; Bradford (3.9%), Doncaster (3.6%) and Leeds (3.4%).
  - **The stillbirth rate in the region is similar to the England average, at 4.1 and 4.0 per 1,000 respectively.**
  - **The infant mortality rate in the region (4.2 per 1,000) is worse than the national average** (3.9 per 1,000), the highest rates by local authority are in in Kirklees and Bradford (6.2 per 1,000 and 6.1 per 1,000 respectively)

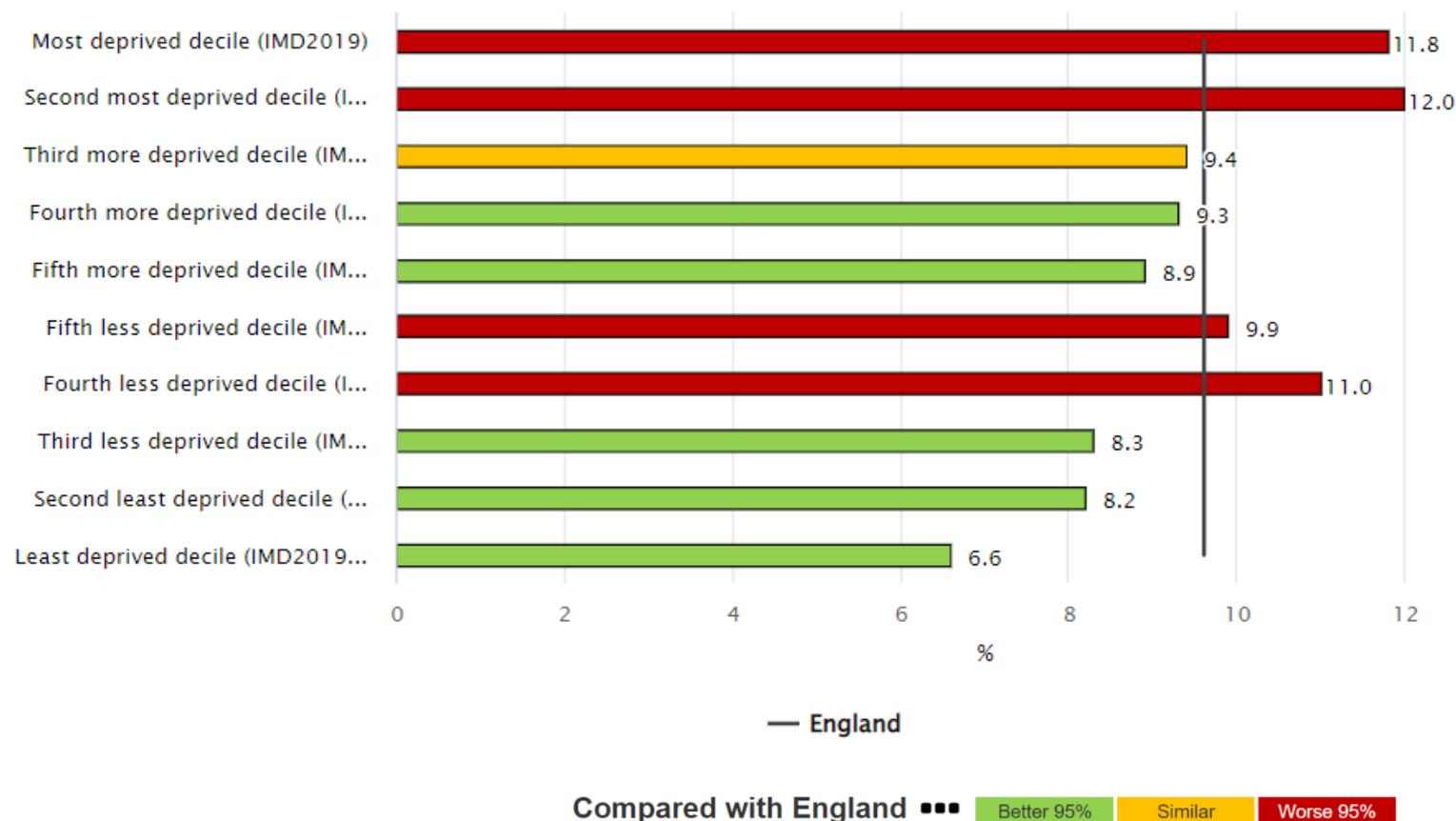
Source: [Public Health Profiles: Child and Maternal Health](#). 2021 © Crown copyright 2021



**Smoking in pregnancy and at the time of delivery: Health inequalities in prevalence and associated health outcomes**

# Health inequalities: Smoking at the time of delivery

Smoking at the time of delivery by deprivation decile, England. 2020/21. Proportion (%) of maternities

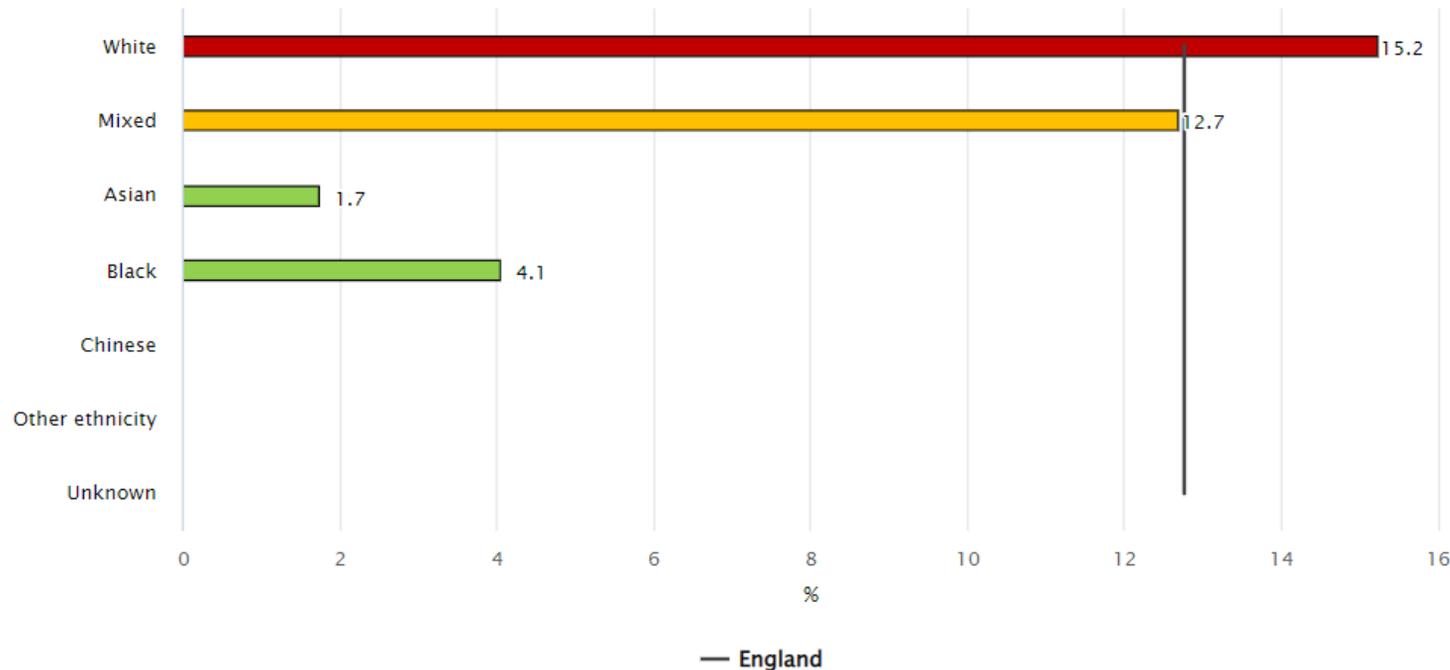


- Women living within the two most deprived deciles nationally are more likely to smoke at the time of delivery. Whilst the lowest prevalence is in the three least deprived deciles.
- There seems to be no clear social gradient given that higher than national average proportions are also seen in the fifth and fourth less deprived deciles.

Source: [Public Health Profiles: Child and Maternal Health - Inequalities](#). 2021 © Crown copyright 2021

# Health inequalities: Smoking in pregnancy by ethnicity

Smoking in pregnancy by ethnicity, England. 2018/19. Proportion (%) of maternities



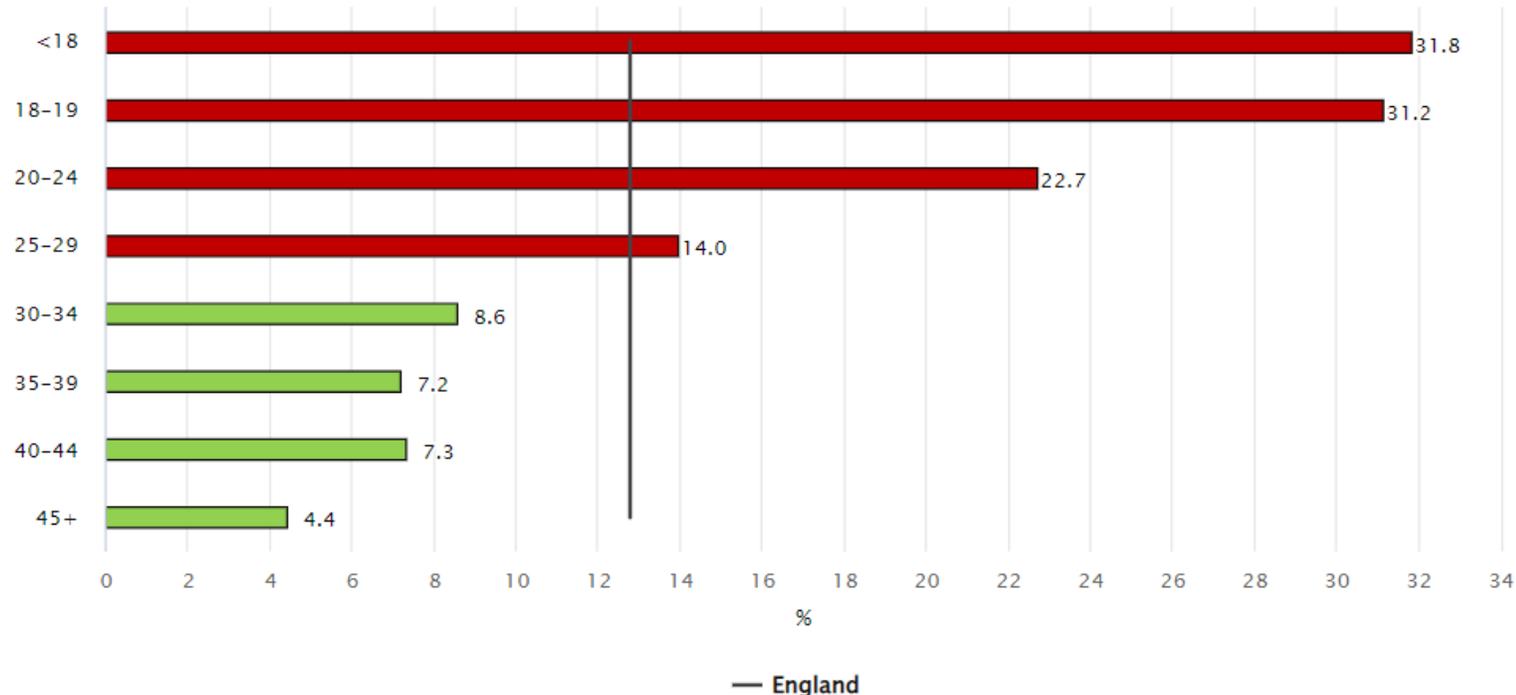
- The largest proportion of women reporting smoking at their booking appointment was among women with white ethnicity (15.2%), followed by women of mixed ethnicity (12.7%).

Compared with England ■■■ Better 95% Similar Worse 95%

Source: [Public Health Profiles: Child and Maternal Health - Inequalities](#). 2021 © Crown copyright 2021

# Health inequalities: Smoking in pregnancy by age

Smoking in pregnancy by age group, England. 2018/19. Proportion (%) of maternities



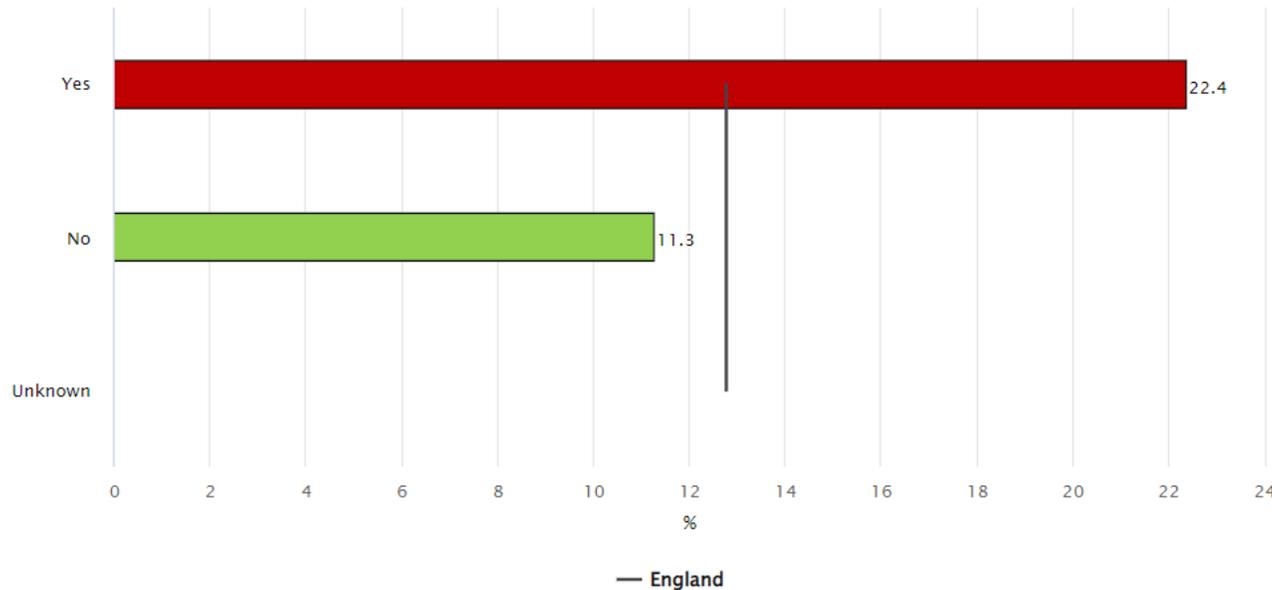
- Younger women were more likely to smoke during pregnancy. Age groups with higher than the average smoking rates were those aged under 30

Compared with England **•••** Better 95% Similar Worse 95%

Source: [Public Health Profiles: Child and Maternal Health - Inequalities](#). 2021 © Crown copyright 2021

# Health inequalities: Smoking in pregnancy by complex social factors

Smoking in pregnancy by complex social factors, England. 2018/19. Proportion (%) of maternities



- Women identified with complex social factors are more likely to smoke during pregnancy (22%).
- Complex social factors include women 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.

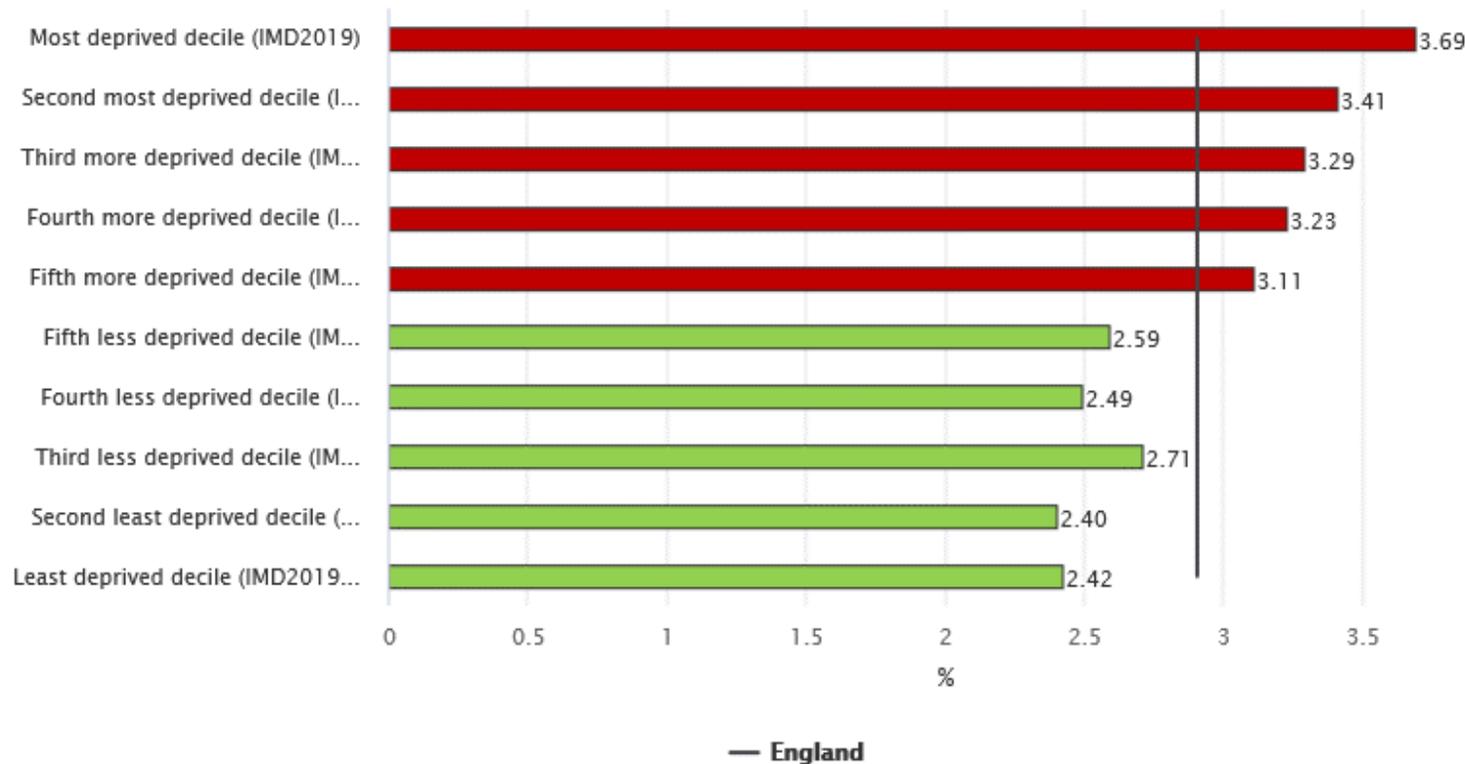
Compared with England **•••** Better 95% Similar Worse 95%

Source: [Public Health Profiles: Child and Maternal Health - Inequalities](#). 2021 © Crown copyright 2021. For complex social factors see: See [NICE guidance CG110](#) for detailed definition.



# Health inequalities in maternal outcomes: Low birth weight of term babies

Low birth weight of term babies, England. 2019. A proportion (%) of all full term live births



- National level data shows a gradient by deprivation of term babies born with low birth weight, an outcome which is associated with smoking in pregnancy.
- From areas in the most deprived to the fifth most deprived deciles have significantly higher proportion of term births at low birth weight.
- A similar gradient is found in term babies born with a [“very” low birth weight](#) (<1500g).

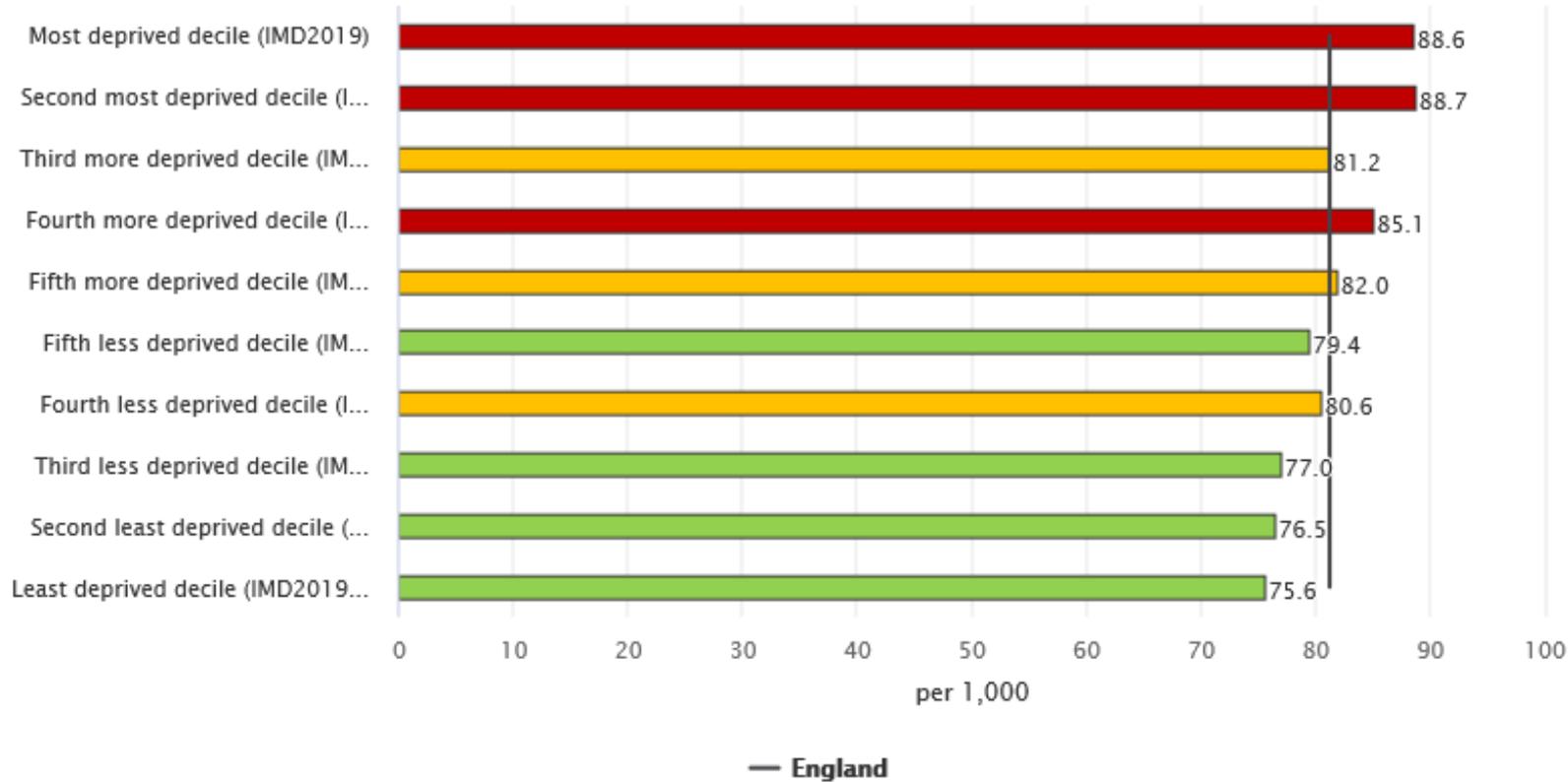
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Source: [Public Health Profiles: Child and Maternal Health - Inequalities](#). 2021 © Crown copyright 2021



# Health inequalities in outcomes: Premature births (less than 37 weeks)

Premature births, England. 2016-18. Crude rate of premature live births (gestational age between 24-36 weeks) and all stillbirths per 1,000 live births and stillbirth



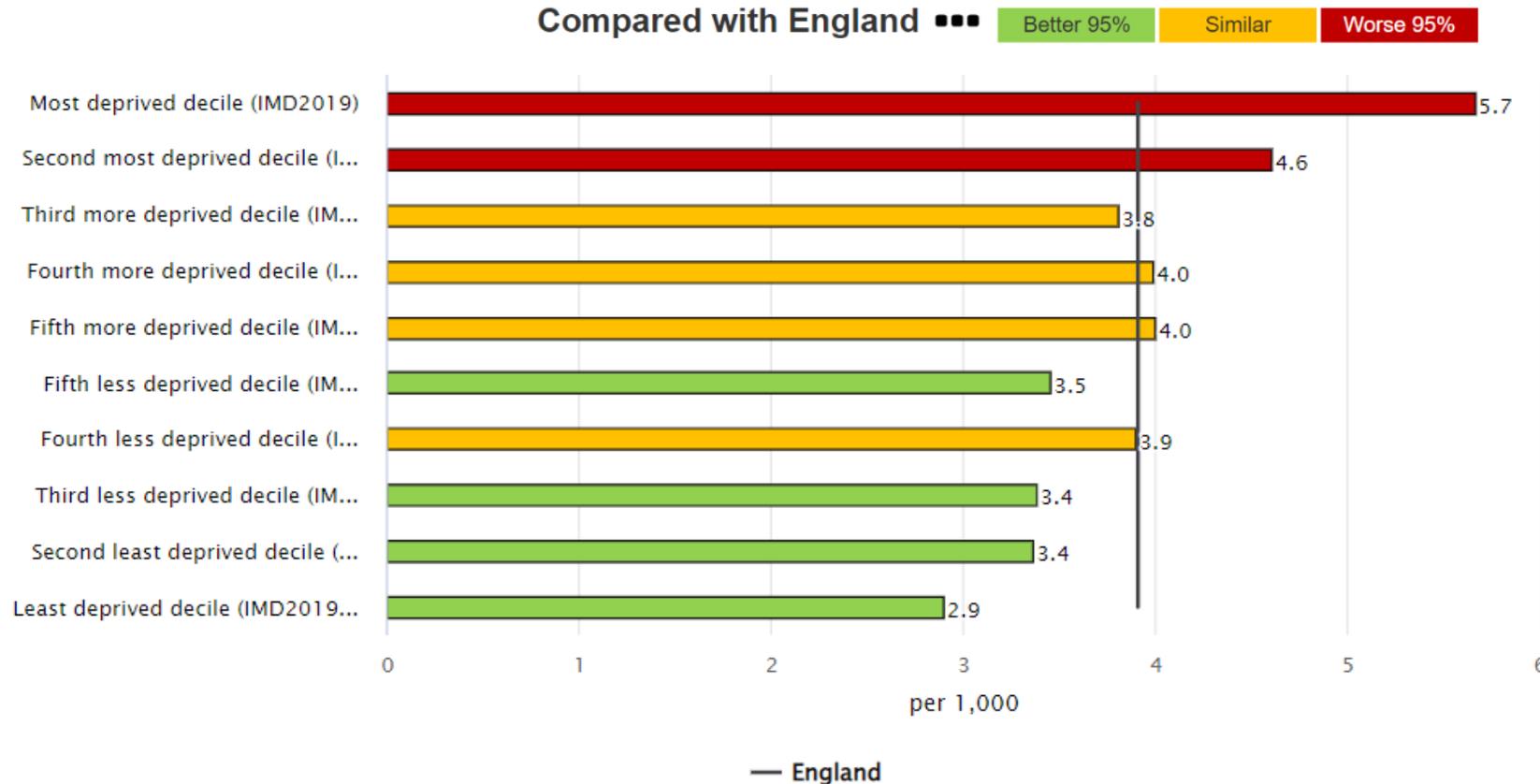
- Generally, premature births follow a similar gradient by deprivation to the other associated outcomes.
- The most, second and fourth deprived deciles have significantly higher rates of premature births.

Compared with England ●●● Better 95% ■ Similar ■ Worse 95%

Source: ONS, available via [Public Health Profiles: Child and maternal health/Inequalities](#). 2021 © Crown copyright 2021

# Health inequalities in outcomes: Infant mortality

Infant mortality, England. 2018-20. Crude rate per 1,000



- Infant mortality rate, a key indicator for health of the population, is associated with deprivation.
- The most deprived decile has an infant mortality rate of 5.7 per 1,000, almost twice that of the least deprived decile (2.9 per 1,000).

Source: ONS available from [Public Health Profiles: Child and maternal health/Inequalities](#). 2021 © Crown copyright 2021

# Characteristics of women who stop smoking in pregnancy

The recent report “[Characteristics of women who stop smoking in pregnancy](#)” usefully compares the demographic, socioeconomic, social complexity and lifestyle factors that influence the likelihood of smoking and stopping smoking in expectant mothers:

- **Region** - Women living in the North East are the least likely of all regions to quit smoking during early pregnancy but are most likely to stop smoking in late pregnancy.
- **Deprivation** - Mothers living in the most affluent areas are more likely to stop smoking in early pregnancy compared to those in the most deprived areas, who are the most likely to smoke throughout pregnancy.
- **Age** - Although women aged under 20 are the most likely of all age groups to be smokers during early pregnancy, they are the least likely to continue to smoke at the time of delivery (more likely to stop in late pregnancy). Women in their 30s are most likely to stop smoking prior to pregnancy or during early pregnancy.
- **Ethnicity** - The highest proportion of women who stopped smoking in early pregnancy are women with Asian ethnicity (38.5%) and women with Black ethnicity (37.7%). While women of white ethnicity are most likely to be smokers during pregnancy and least likely to stop smoking.

Source: Public Health England, [Characteristics of women who stop smoking in pregnancy, 2021](#)

# Characteristics of women stop smoking in pregnancy



- **Employment** - Women in employment are twice as likely to stop smoking during pregnancy than women who are unemployed.
- **First time mothers** - Women experiencing a subsequent pregnancy were more likely to be smokers in early pregnancy than those pregnant for the first time (10.4% compared with 6.4%)
- **Partners** - Pregnant women are also more likely to smoke, and relapse if they do quit, if they have a partner that smokes
- 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.

Source: Public Health England, [Characteristics of women who stop smoking in pregnancy, 2021](#)

# Summary

- Whilst smoking rates at the time of delivery have been decreasing in Yorkshire and the Humber, the region and the majority of its local authorities continue to be significantly above the England average.
- Smoking in pregnancy is a well-known risk factor for the growth and development of the baby and health of the woman, including: premature birth, stillbirth, low birthweight and sudden unexpected death in infancy. Of the health outcomes associated with smoking in pregnancy, infant mortality continues to be worse than the England average. The overall regional prevalence of premature deliveries (under 37 weeks), low birth weight term babies, and stillbirth rates are not statistically different compared to the England average.
- Statistics on smoking in pregnancy, at time of delivery and associated health outcomes suggest wide inequalities by region, deprivation, ethnicity and age.
- Recent experimental statistics suggest that 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. Data on younger mothers suggest that this age group may respond well to public health messages and 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. Tailored responses and targeted interventions to help these specific cohorts of women may help to ensure more women and their partners are supported to become smoke-free.

*The indicators on smoking are based on self-reporting of smoking status therefore bias may remain as women may under-report smoking in early pregnancy. The Maternity Services Data Set used for the analysis and in the [Characteristics of women who stop smoking in pregnancy](#) report is still classed as experimental as not all data items are flowing successfully from all providers. The data presented here does not measure interaction between risk factors, therefore findings should be interpreted alongside other evidence and research, including evidence outlined in further resources section at the end of the report.*



# Further resources

## Effective interventions

### [Getting Back on Track – Delivering a Smokefree start for every child](#)

Primarily focussed on COVID-19 recovery, this report is the most up to date overview of the various options available to pregnant women, and their partners, to quit smoking. Most importantly, there are several recommendations for the advantages of partnership working across multiple settings to support pregnant women.

### [Health Matters: stopping smoking – what works](#)

Useful blog post giving a summary of different stop smoking interventions and their relative effectiveness. Talks about generic populations but is applicable to pregnant women too.

## Guidance

### [NICE Guidance 92 – Stop smoking interventions and services](#)

National guidance on the most effective interventions for supporting a quit attempt. No equivalent guidance specifically for pregnant women exists (evidence is transferable).

### [Tobacco Control Plan for England](#)

The Tobacco Control Plan sets out national objectives with regard to smoking prevalence. Smoking in pregnancy is a key driver of inequality within the tobacco agenda and this plan sets out strategic approaches for creating better environments for supporting women, and their families, to quit.



# Data sources and references

Fingertips Child and Maternal Health Profile: [Child and Maternal Health](#)

Fingertips Child and Maternal Health Profile, Topic: [Pregnancy and Birth: Child and Maternal Health](#)

Fingertips Public Health profiles: [Local Tobacco Control Profiles](#)

Public Health England (2021): [Characteristics of women who stop smoking in pregnancy - GOV.UK \(www.gov.uk\)](#)

National Centre for Smoking Cessation and Training: [NCSCT maternity care v6](#)

NHS (2019): [Stop smoking in pregnancy - NHS \(www.nhs.uk\)](#)

For further information about these resources and health intelligence available on smoking or maternity please email: [LKISNorthEastandYorkshire@phe.gov.uk](mailto:LKISNorthEastandYorkshire@phe.gov.uk). We would also welcome any feedback on our briefings and suggestions for future topics.

