

The purpose of this report is to provide information to the RIC in City CCG to inform the planning of interventions and targeting of services to reduce health inequalities in City CCG. This is not a full list of data / findings and will be added to over the coming months.

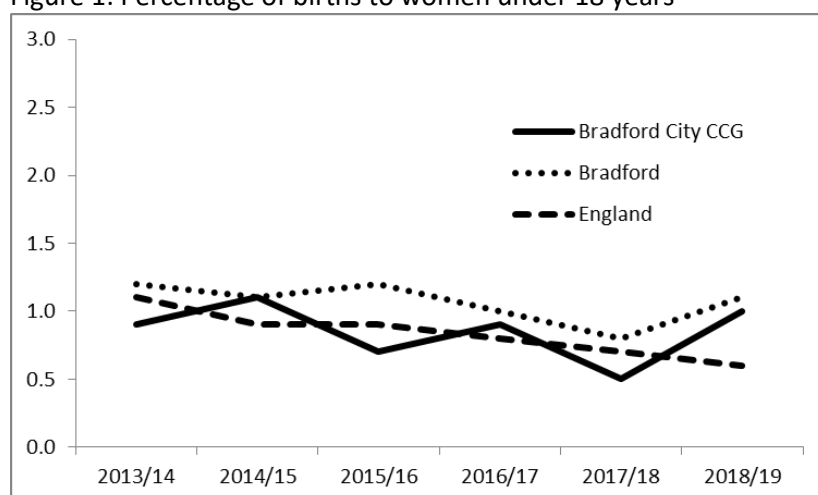
This report has been prepared by the Bradford Inequalities Research Unit, Born in Bradford. Any queries / request for more in-depth findings should be requested to bo.hou@bthft.nhs.uk and brian.kelly@bthft.nhs.uk

1: Understanding the needs of the City CCG population

Pregnancy and the early years

- 1.1 Bradford City CCG has a high birth rate, with 80 births per 1000 population of women aged 15 to 44 years compared to 73 in the Bradford local authority district and 61 in England. ^{*1}
- 1.2 Public Health England data for 2016/17 ^{*1} indicates that in Bradford City CCG around 85% of all births were to mothers from Black and Minority ethnic populations. This is far higher than the England average of 24%, and the Bradford average of 50%. Our own analysis of women in Bradford City CCG giving birth over the last 3 years (from Bradford maternity data) identifies the three largest ethnic groups as Pakistani heritage (63.8%), Other White (8.4%) and White British (6.0%).
- 1.3 Around 1% of births in Bradford City CCG are to mothers who are less than 18 years of age; this is slightly higher than the current England average of 0.6%. Rates for England as a whole have fallen over the last five years, while the rate in Bradford City CCG has remained constant, see figure 1. Analysis of Bradford maternity data indicates that 4% of mothers registered with GP practices aligned with Bradford City CCG were less than 20 years of age, compared to 6% of mothers registered with Bradford District CCG.

Figure 1: Percentage of births to women under 18 years

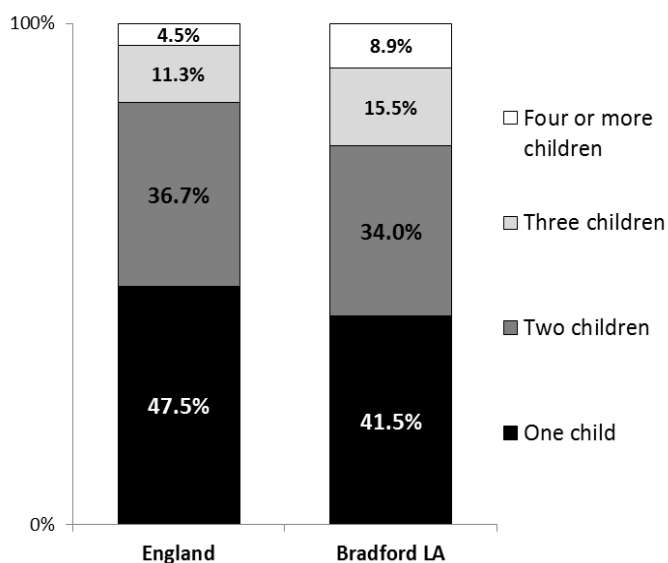


Source: Public Health England: <https://fingertips.phe.org.uk/profile/child-health-profiles>

1.4 Compared to the England average Bradford City CCG has a high proportion of the population aged less than 5 years of age (around 9% of the total population in Bradford City CCG, compared to around 6% in England as a whole). The absolute number of children aged less than 5 years is projected to fall over the next decade or so, but the percentage of under 5 years old, as a proportion of the total population, is set to remain fairly constant. *²

Families in Bradford tend to be larger than the English average; around 24% of Bradford families have three or more children, compared to 16% in England as a whole, see figure 2.

Figure 2: Family size Bradford and England

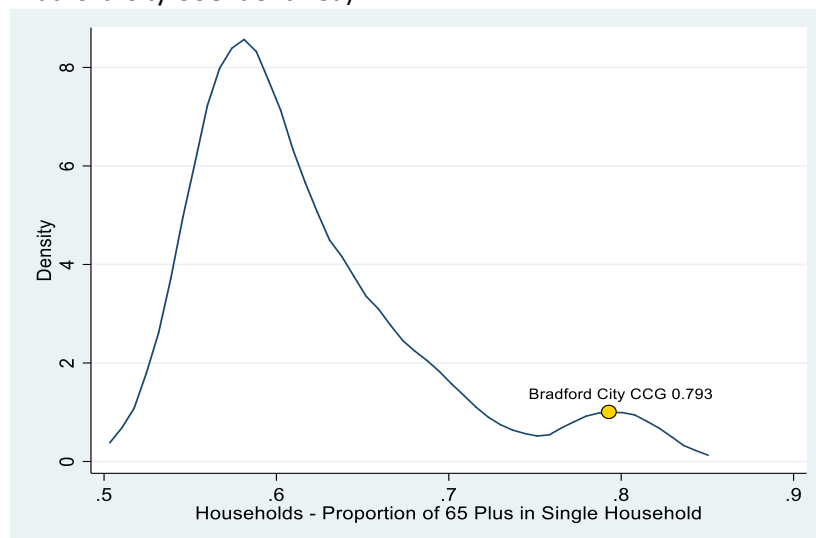


Source: Families in receipt of Child Benefit, August 2018 <https://www.gov.uk/government/statistics/child-benefit-statistics-geographical-analysis-august-2018>

1.5 Bradford City CCG has a young age profile compared to England as a whole, with a higher proportion of children and younger adults (particularly men aged around 25 to 39 years). There are fewer older people as a proportion of the population; this is noticeable from around the age of 50 years onwards. Those older people who do live in Bradford City CCG were more likely to be in ill health (this can be seen looking at life expectancy and mortality data, for example rates of avoidable mortality are 70% higher in Bradford City CCG compared to England as a whole). Also those older people who do live in Bradford City CCG are more likely to live alone, almost 80% of those aged 65 or more live in single person households, see figure 3.

Implications for RIC: City CCG has a young population with a high birth rate. Intervening early has lifelong effects on the health, wellbeing and educational attainment of children. RIC should make sure a significant proportion of interventions focus on early intervention, and are appropriate to the key ethnic groups in the area. Older people in Bradford City CCG are more likely to live alone, indicating that issues related to isolation and engagement with health services.

Figure 3: Proportion of those aged 65 plus who live in single person households by CCG (with Bradford City CCG identified).



Source: ONS, Census 2011 (KS105EW - Household composition)

The CCG Population

1.6 Some areas within the geographical boundary of Bradford City CCG have a relatively low proportion of patients registered with a GP practice associated with the City CCG when compared to other areas. In some parts less than 25% of residents are registered with a City CCG GP practice (the others mostly being registered with a District CCG GP practice), conversely some areas outside the geographical boundary of Bradford City CCG have over half of residents registered with a City CCG GP practice, see figure 4. This has implications for place based interventions.

1.7 There are a larger number of people leaving Bradford to live in other parts of the UK than coming to live here and a large number of international migrants. In 2015/16 the net internal migration was minus 2,600 and the net international migration was 2,300. Compared to other local authorities Bradford has high levels of net migration (inflow minus outflow) but low levels of gross migration (inflow plus outflow), see figure 5. In parts of Bradford City CCG the rate of internal migration is high, with over 50% of the population living lived elsewhere one year previously, while in other areas of the CCG this is under 10% (see figure 6).

Similarly the proportion of the population born outside the UK is high in the Bradford City CCG area being over 40% of the population in most parts of the CCG, though this varies from around 12% to around 60% across parts of the CCG area, see figure 7.

Figure 4: Map showing the proportion of LSOA residents that are registered with a GP practice affiliated with Bradford City CCG

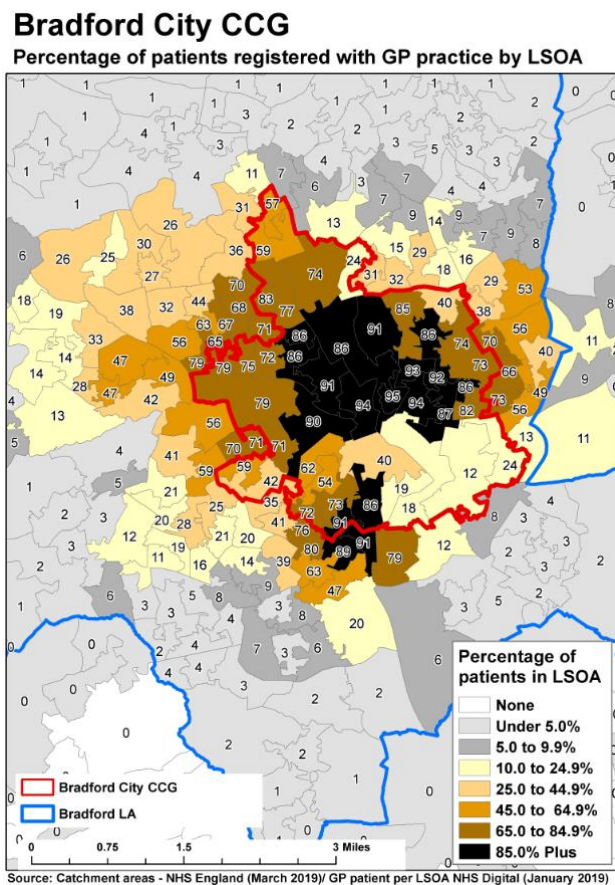
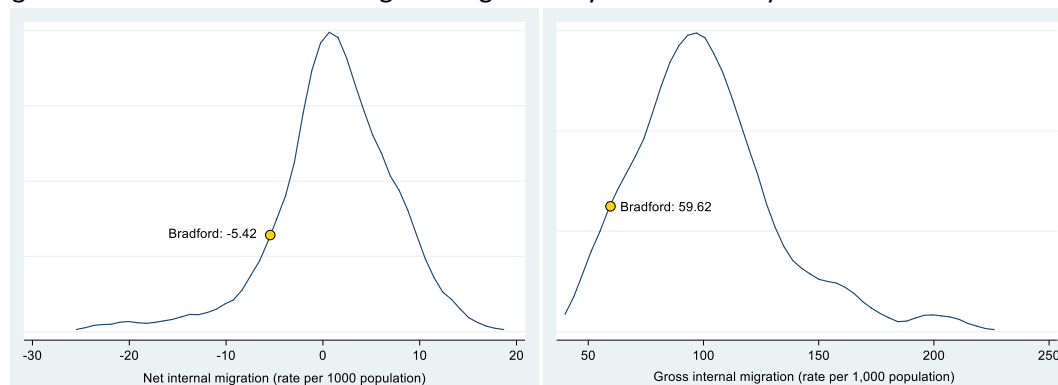


Figure 5: Distribution of net and gross migration by local authority



Source: ONS Internal migration 2015

<https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/migrationwithintheuk/bulletins/internalmigrationbylocalauthoritiesinenglandandwales/yearendingjune2015>

Figure 6: Map showing the percentage of usual population that had lived elsewhere one year previously (internal migration inflow)

2011 Census Data: Migration by Output Area

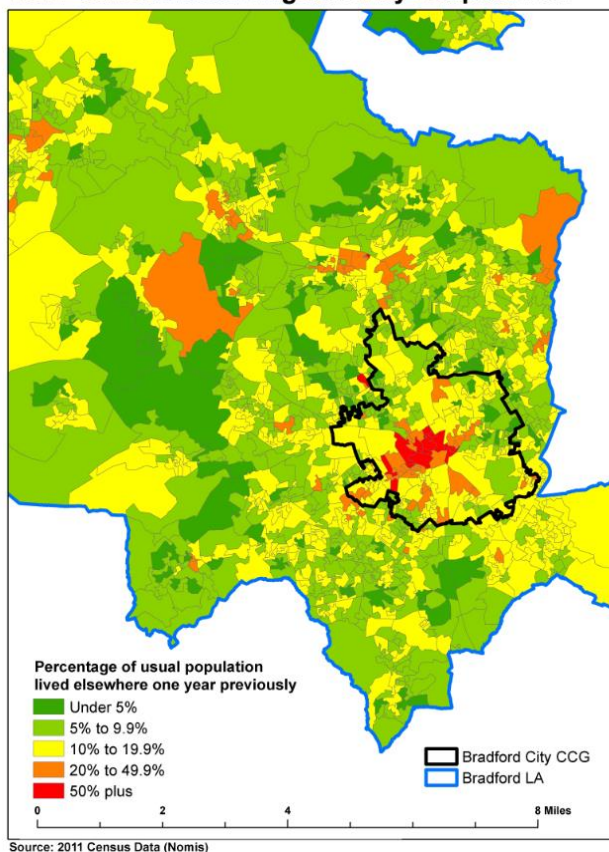
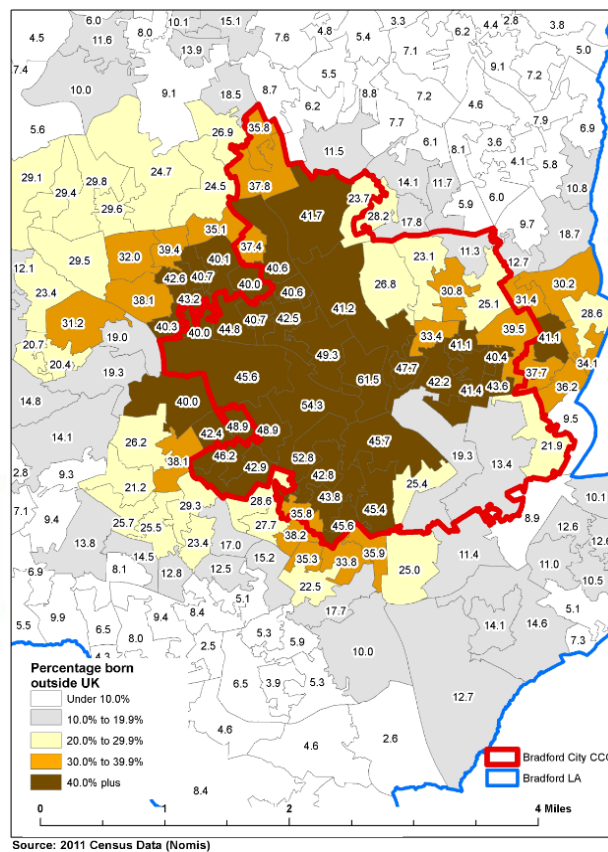


Figure 7: Map showing the percentage of population that were born outside the UK



The population movement patterns (negative net migration over the life course) may be part of the explanation for why the older population in Bradford City CCG is, on average, in poorer health (if the net negative migration is associated with more healthy individuals moving out). Health services and RIC interventions need to be able to engage with populations that are changing, particularly in those areas with the highest population turnover. The effect of early life interventions on population health in subsequent years is likely to be diluted by population movement; the Born in Bradford cohort study estimates that around 10% of children born at Bradford Royal Infirmary will have moved out of Bradford local authority by the age of 10 years.

Implications for RIC: Place based interventions such as in schools / local areas must be cognisant of the differences in levels of City CCG registered patients in the areas. More impact will be made by focussing place-based interventions in areas of high registrations. Mobility in City CCG is also high meaning that health interventions and/or health outcomes that rely on a stable population will not work as well within City CCG.

Mortality

- 1.8 Infant mortality is high in Bradford City CCG and Bradford local authority district, 6.6 per 1000 and 5.7 per 1000 respectively, compared to 3.9 per 1000 in England. Child mortality (age 1 to 7 years) is also particularly high in Bradford City CCG at 24 per 1000; this is considerably higher than Bradford district at 15 per 1000 and England at 11 per 1000.
- 1.9 In Bradford City CCG mortality rates are high for those entering old age, the mortality rate for those aged 65 to 74 years of age is 75% higher than the rate for England; life expectancy in Bradford City CCG is 6 years lower than the England average for men and 4 years lower than the England average for women.

Implications for RIC: Infant and child mortality is too high in City CCG. Interventions focussed on reducing the evidenced risks of infant and child mortality should be prioritised and evaluated carefully for impact.

2. Considerations for the Preconception, maternity & childhood theme

2.1 Smoking in pregnancy

Using recent maternity data, we have looked at both self-reported smoking status at booking and results based on exhaled carbon monoxide tests *³ in three biggest ethnic groups in City CCG. Results are shown in table 2.11. For self-reported smoking status at booking for the period, smoking rate is 45% for the White British group, 4.5% for the Pakistani heritage group and 41.5% for the Other White. These statistics have been stable over this period between 2016 and 2018. From exhaled carbon monoxide tests, high level of exposure to carbon monoxide (CO) is indicative of smoking. 29.2% of White British group is in high exposure group compared with 3.1% of Pakistani heritage group and with 25.8% of the Other White.

Table 1: Smoking in pregnancy, Bradford City CCG (%)

	Self-reported smoking status			Est.	High level of exposure to carbon monoxide	
	Est.	Low 95% CI	High 95% CI		Low 95% CI	High 95% CI
White British	44.9	39.2	50.6	29.2	23.8	34.5
Pakistani heritage	4.5	3.7	5.2	3.1	2.5	3.7
Other White	41.5	36.7	46.3	25.8	21.4	30.1

Source: Medway data 2016-2018

With maternity data, we could also look at moderate level of exposure to CO. Being in this group is possibly indicative of second-hand smoking. Table 2.12 below shows these results. 25.1% of White British is in this group compared with 9.74% of Pakistani heritage group and with 21.1% of other ethnic group. This highlights Pakistani heritage women have a relatively high risk of moderate level of exposure to carbon monoxide possibly from second-hand smoking, considering this group has always been regarded as have a lower risk of smoking during pregnancy.

Table 2.12 Moderate level of exposure to carbon monoxide, City CCG (%)

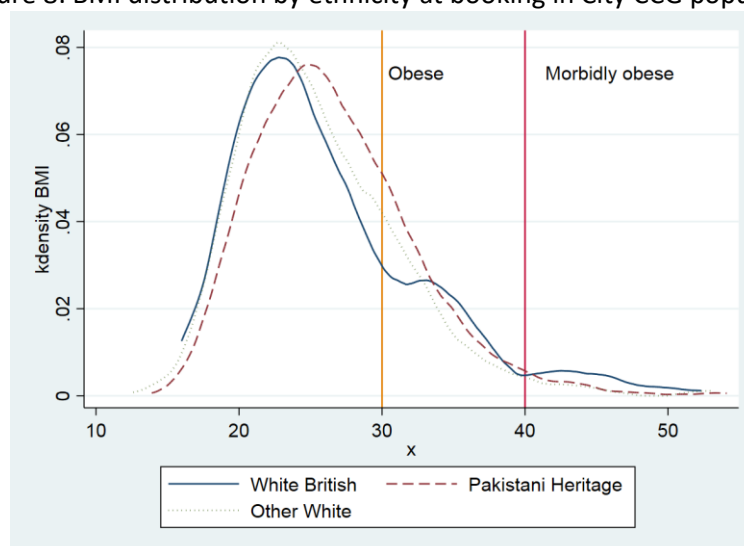
	Est.	Low 95% CI	High 95% CI
White British	25.1	19.0	31.2
Pakistani heritage	9.7	8.7	10.8
Other White	21.1	16.4	25.8

Source: Medway data 2016-2018

2.2 BMI at booking,

In City CCG population, the Maternity data show the level of obesity is similar among different ethnic groups. 24.2% of White British group is obese (BMI>30) compared with 24.7% of Pakistani heritage group and with 20.8% in the Other White group. For overweight (BMI>25), Pakistani heritage women have higher percentage in this group (44.2%) compared with 32% of the White British group and with 34.4% of the Other White group. For morbidly obese (BMI>40), White British pregnant women have the highest rate compared with Pakistani heritage and Other White (5.1% vs 2.3% vs 2%). A graphic representation of these can be found in the figure8 below.

Figure 8: BMI distribution by ethnicity at booking in City CCG population



Source: Medway data 2016-2018

Implications for RIC: Smoking cessation in pregnancy should target the White British population where almost one in two women smoke. Interventions should also extend to the Other White group, which has very high rates of smoking during pregnancy. It may be beneficial to target 'secret smokers' and the wider family living with pregnant women of a Pakistani heritage (i.e. where CO levels are high). It is important to understand the main causes of high rates of moderate level of exposure to CO in City CCG population, which will help RIC to plan future interventions.

A large proportion of pregnant women are overweight or obese and this has known negative impacts on birth outcomes and is also a risk factor for child obesity. Interventions to reduce BMI in pregnancy don't often work, RIC should focus on preconception reduction in BMI, or postpartum reduction. Breastfeeding is a protective factor against childhood obesity, and whilst BSB has shown that breastfeeding at birth is high in this population, duration of breastfeeding is short.

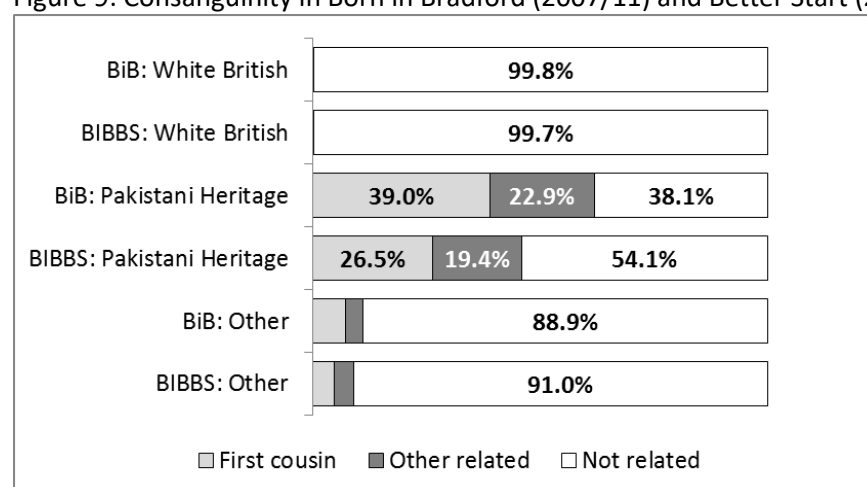
Interventions to maintain breastfeeding may be beneficial.

2.3 Consanguinity

We looked at levels of consanguinity in women giving birth over time by comparing data from the Born in Bradford's Better Start birth cohort (n=2949, collected 2016/20) with data from the Born in Bradford cohort from the same Better Start geographical area (n= 2473, collected 2007/11).

Rates of consanguinity are high in the Pakistani heritage population, particularly for women born in Pakistan, but there is some evidence that there has been a decrease over time. Data from the Born in Bradford cohort (collected in 2007 to 2011) suggests that 39% of Pakistani heritage women giving birth were related to the father of the child as first cousins; by the time of the Better Start cohort (2016/20) this had fallen to 26%, see figure 9.

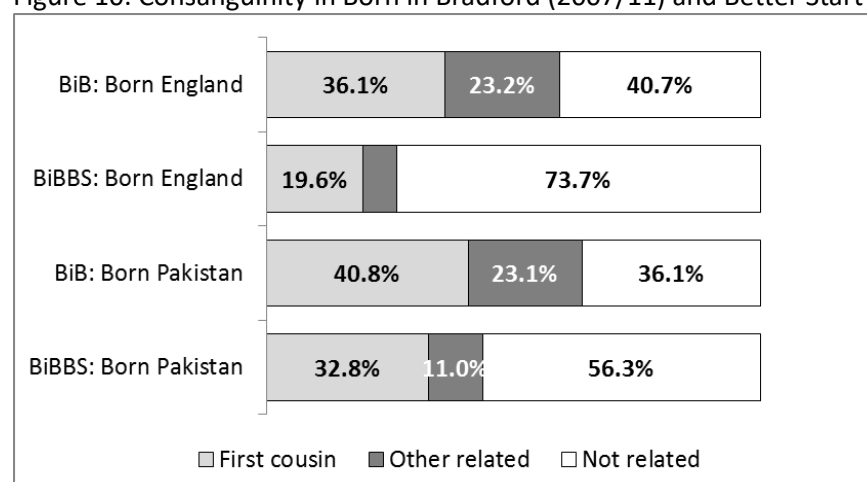
Figure 9: Consanguinity in Born in Bradford (2007/11) and Better Start (2016/20)



Source: Born in Bradford (2007 to 2011) and Better Start Bradford (2016 to 2020) birth cohorts

Data suggests that women of Pakistani heritage who were born in Pakistan were more likely to be related to the father of their child when compared to Pakistani Heritage women who were born in the UK, the difference between these two groups has grown over time, see figure 9.

Figure 10: Consanguinity in Born in Bradford (2007/11) and Better Start (2016/20)



Source: Born in Bradford (2007 to 2011) and Better Start Bradford (2016 to 2020) birth cohorts

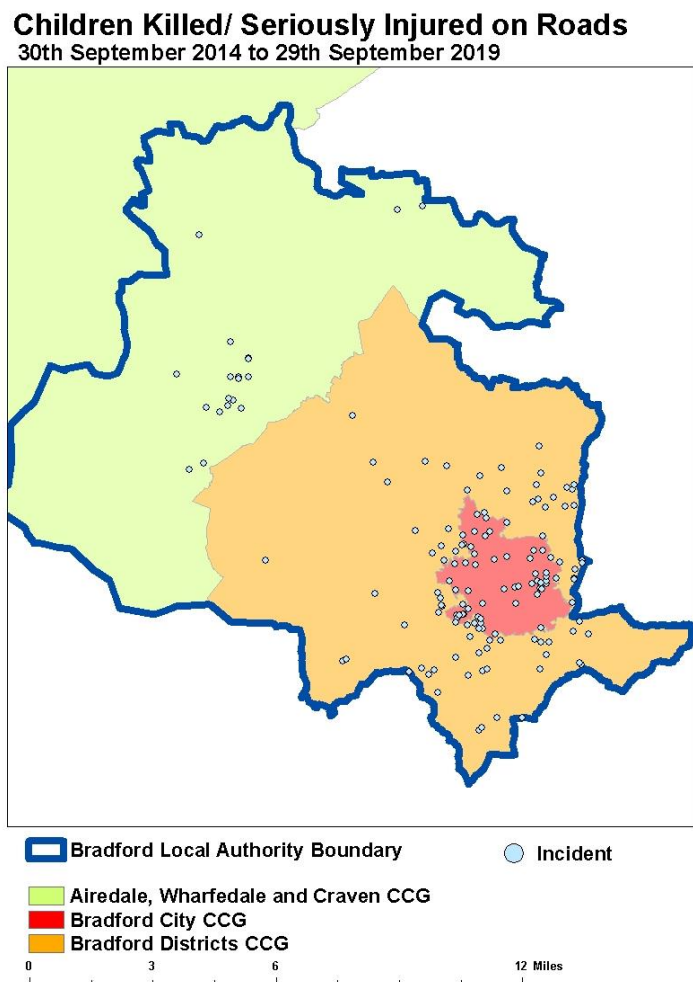
2.4 The main causes of child mortality

The main causes of child mortality in Bradford are mainly related to genetic conditions (Category 7 chromosomal, genetic and congenital anomalies) and perinatal/neonatal events (Category 8); with the former accounts for 43% of death and the latter accounts for 29% of death between 2017 and 2018 *⁴. The cause of death related to genetic conditions (Category 7) is especially high compared with national average of 25%. Consanguinity is likely to be an important contributor to this as well as unknown genetic causes.

2.5 Road traffic accidents

Figure 11 shows a map of incidents where children were killed or seriously injured in road traffic accidents shows this suggests that there may be hotspots for interventions to tackle road safety (perhaps led by the local authority).

Figure 10: Map showing the location of incidents where children were killed or seriously injured on roads

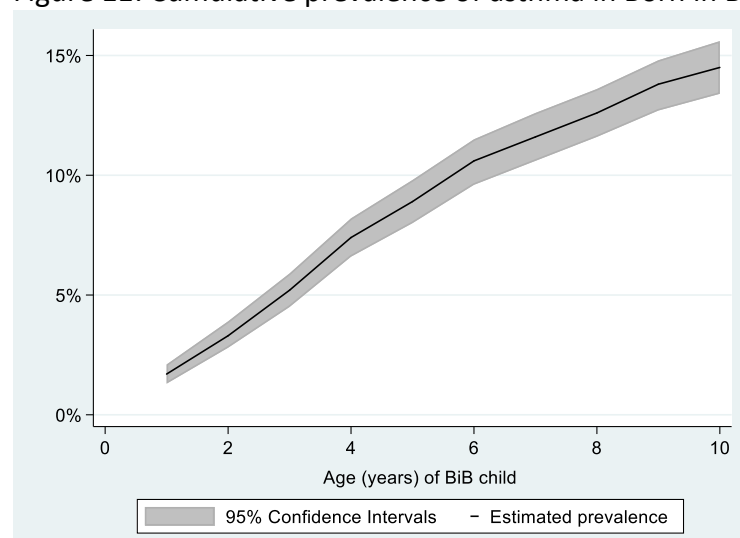


Source: Bradford Local Authority KS1 data

2.6 Childhood asthma

Almost one in eight (14.5%) of BiB children had a diagnosis of asthma recorded in their GP records by the age of 10 years (this is considerably higher than the estimated rate of one in eleven children of any age in the UK), see figure 12.

Figure 11: Cumulative prevalence of asthma in Born in Bradford cohort



Source: Born in birth cohort

BiB children registered with a GP practice aligned with Bradford City CCG were more likely to have been diagnosed with asthma (16.0%, compared to 13.5% in Bradford District CCG). However once ethnicity of BiB children is accounted for there is no significant difference between asthma rates in the two CCG's. This is because asthma rates are considerably higher in Pakistani heritage children (16.2%) compared to White British children (12.6%) and once the ethnic makeup of the CCG is controlled for the differences between CCG areas becomes non-significant, while ethnic differences remain.

Rates of hospital emergency admissions for respiratory problems in children aged under 18 years is high in Bradford City CCG (around 20% higher than the average for England), see table 2.

Table 2: Emergency admissions for respiratory problems for children aged under 18 years.

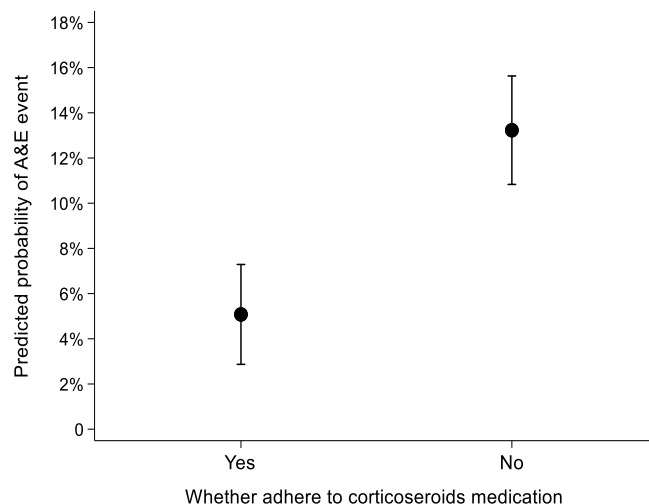
Area	Rate per 1,000 2011/12 to 2015/16
England	3.87
NHS Bradford City CCG	4.7
NHS Bradford Districts CCG	4.76

Source: <https://fingertips.phe.org.uk/profile/general-practice>

We looked at the Born in Bradford data and found that male children and children of Pakistani heritage are most likely to attend accident and emergency for asthma or wheeze related conditions, as were children who were born low birthweight.

The percentage of Born in Bradford children with diagnosed asthma who do not adhere to corticosteroid medication is high, particularly for children from ethnic minorities, or whose mothers were born outside the UK. Born in Bradford children with asthma who do not adhere to corticosteroid medication are almost three times as likely to experience an accident and emergency event related to asthma or wheezing than those children who do adhere to corticosteroid medication; 13.2% (95% CI: 10.8%-15.6%), compared to 5.1% (95% CI: 2.9%-7.3%), see figure 13. These results suggest cause for concern.

Figure 13: Predicted probability of accident and emergency attendance for asthma or wheeze for children with diagnosed asthma by adherence to corticosteroids.



2.7 Oral health

Oral health for Bradford City CCG children is statistically significant worse compared with national average. For instance, children with one or more decayed, missing or filled teeth for NHS Bradford City CCG (55%) are more than twice compared with the national average (23.3%) in 2016-2017. The trend seems getting worse in the City CCG. In 2014-2015, these statistics were 51.6% for NHS City CCG compared with national average of 24.8% *⁵.

2.8 Child BMI

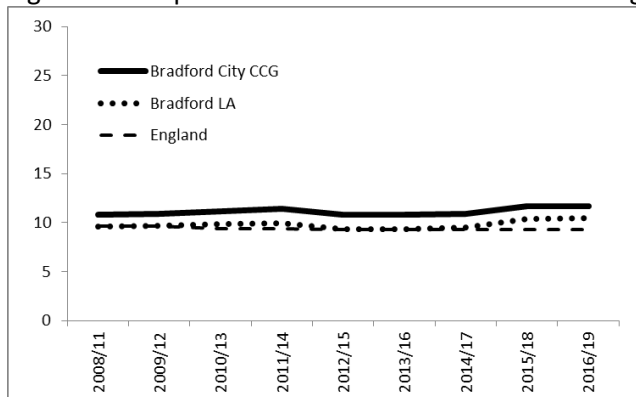
At age around 5 years 12% of children in Bradford City CCG were obese, compared to 10% in Bradford district and 10% in England, see figure 14.

By the age of around 10 years the differences between areas had increased, 28% of children in Bradford City CCG were obese, compared to 25% in Bradford district and 20% in England, see figure 15.

We know from analysing Born in Bradford data that obesity at a young age is associated with an increased use of health care provision and increased morbidity in childhood , see figure 16.

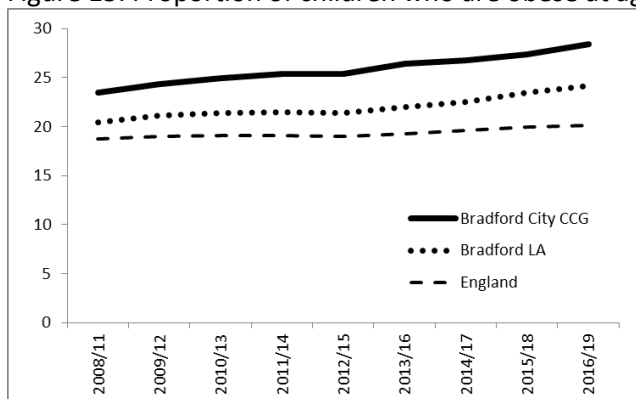
Implications for RIC: Childhood overweight, obesity and poor oral health is extremely poor in City CCG. As well as a targeted interventions, early preventative interventions should be implemented by RIC. Poor management/complicance of medicine in children with asthma causes a high rate of hospital admissions. An intervention to improve management/complicance, (especially in high risk groups – ethnic minorities and migrant parents) should have a large impact on hospital admissions in City CCG.

Figure 14: Proportion of children who are obese at age 5(at school reception class)



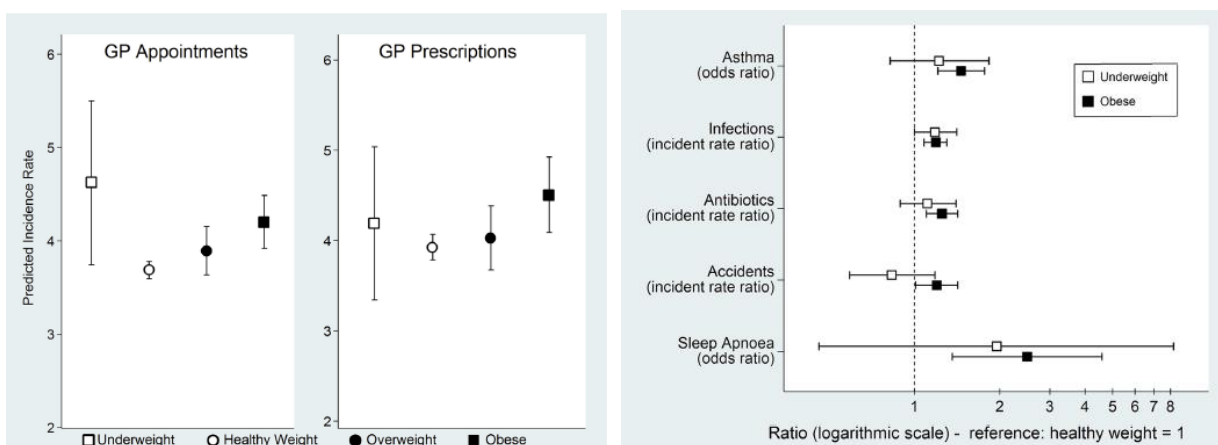
Source: <https://digital.nhs.uk/services/national-child-measurement-programme/>

Figure 15: Proportion of children who are obese at age 5(at school Year 6)



Source: <https://digital.nhs.uk/services/national-child-measurement-programme/>

Figure 16: Health service use and morbidity by child BMI (Born in Bradford cohort)

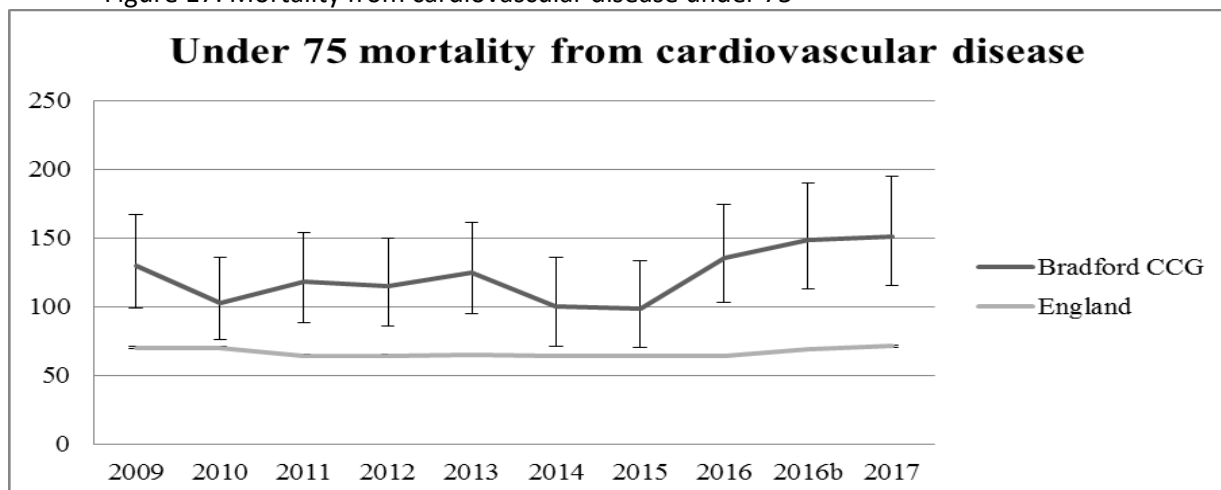


Source: Kelly, B., West, J., Yang, T.C., Mason, D., Hasan, T. and Wright, J., 2019. The association between body mass index, primary healthcare use and morbidity in early childhood: findings from the Born In Bradford cohort study. Public health, 167, pp.21-27.

3 Considerations for Reducing Premature Mortality

Under 75 mortality from cardiovascular disease and respiratory disease

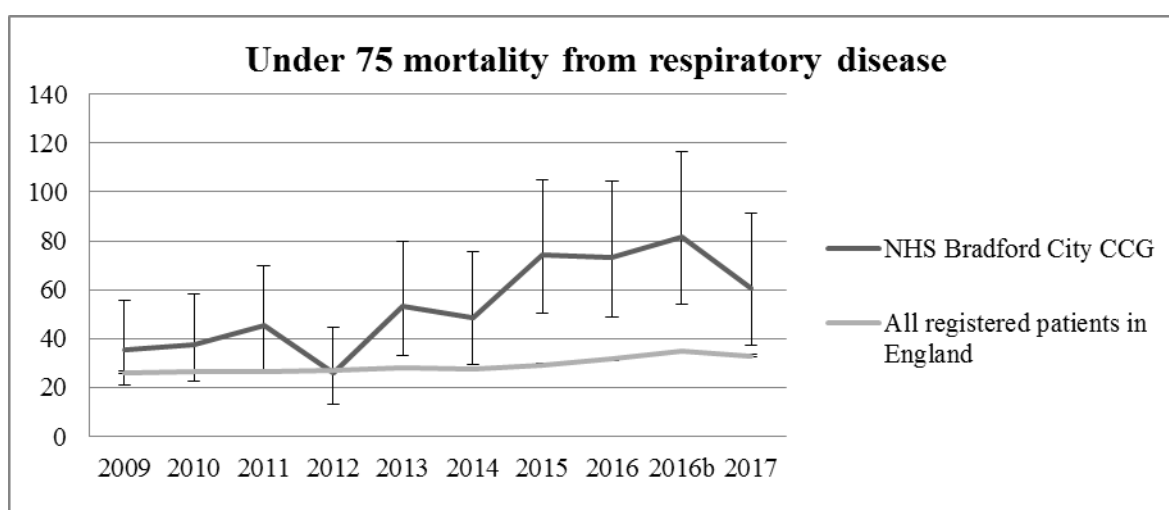
Figure 17: Mortality from cardiovascular disease under 75



Statistic: Directly age and sex standardised mortality rate (DSR) per 100,000 registered patients, Reporting period: 2009 to 2017 (calendar years)

Source: GP registered patient counts from NHAIS (Exeter), Primary Care Mortality Database (PCMD) and European standard population 2013

Figure 18: Mortality from respiratory disease under 75



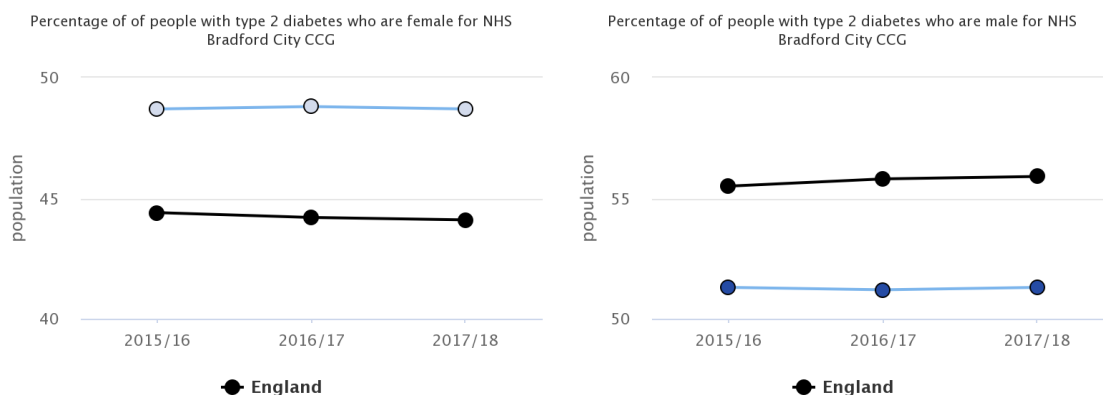
Statistic: Directly age and sex standardised mortality rate (DSR) per 100,000 registered patients

Source: GP registered patient counts from NHAIS (Exeter), Primary Care Mortality Database (PCMD) and European standard population 2013

- Figure 17 and figure 18 show time trends of under 75 mortality from cardiovascular disease and respiratory disease in Bradford City CCG compared with all registered patients in England. Both indicators are statistically significant and higher than that of national rates. In both figures, the Bradford City CCG statistic is almost twice higher than the national average in 2017. Although mortality from cardiovascular disease seems to be increasing from 2015 level, mortality from respiratory disease showed reduction in 2017.

Type 2 diabetes

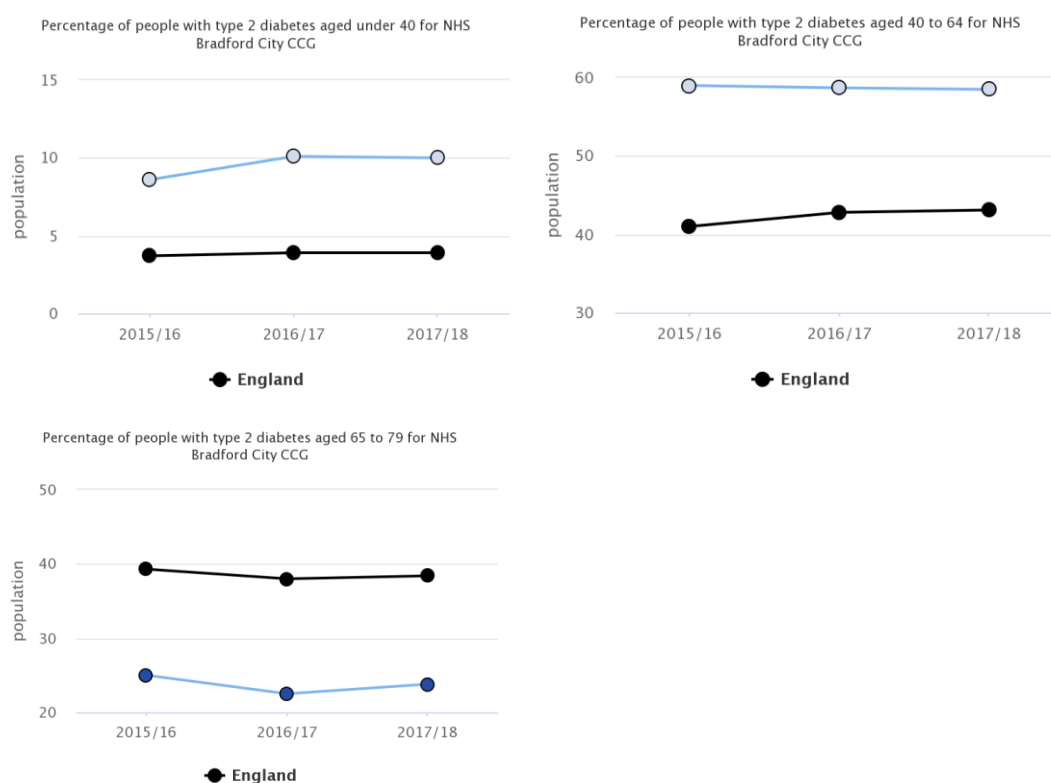
Figure 19: Percentage of people with type 2 diabetes for Bradford City CCG by gender, women (left panel) versus men (right panel)



Source National General Practice Profiles, Public Health England.

- Figure 19 shows women in Bradford CCG have higher rate of type 2 diabetes compared with the national rate. While men have lower rate than national rate.

Figure 20: Percentage of people with type 2 diabetes for Bradford City CCG by age groups, under 40 vs 40-64 vs 65-79



Source National General Practice Profiles, Public Health England.

- From figure 20, under 40 and 40-64 groups, shown in the top two panels in figure 3.14, have higher rates of type 2 diabetes compared with national rates. However, 65-79 age group show lower rates compared with national rate.

Implications for RIC: Although both mortality from respiratory disease and cardiovascular disease under 75 are higher than the national average, there seems to be an improvement in under 75 mortality from respiratory disease in Bradford City CCG. The type 2 diabetes figures may suggest the population that is the most at risk of type 2 diabetes is women who are under 65 in the City CCG population.

*¹: Public Health England
<https://fingertips.phe.org.uk/profile/child-health-profiles>

*² Office for National Statistics
<https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/datasets/clinicalcommissioninggroupsinenglandtable3>

*³ Carbon monoxide (CO) is a poisonous gas and commonly is found in cigarette smoke, exhaust fumes and faulty gas boilers. This is especially risky to pregnant women as it influences a growing baby's access to oxygen. The exhaled carbon monoxide test measures the level of carbon monoxide in the body. A test reading of 1-4 parts per million (ppm) is regarded as low exposure and normal. 5-9 ppm is moderate level of exposure and may suggest exposed to second-hand smoke. Over 10ppm is regarded as high level of exposure and this is a typical reading for smokers <https://www.blf.org.uk/support-for-you/breathing-tests/exhaled-carbon-monoxide-test>

*⁴ Child Death Overview Panel (CDOP) Annual Report 2017-18
<https://www.saferbradford.co.uk/resources/child-death-overview-panel-cdop/#>

*⁵ NHS Digital dental statistics
<https://digital.nhs.uk/data-and-information/publications/statistical/nhs-dental-statistics>