

Health Needs Assessment

Oral Health

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EXECUTIVE SUMMARY

Poor oral health is a major public health problem, owing to its high prevalence and incidence around the world. As with other diseases, the greatest burden of poor oral health is upon disadvantaged and socially marginalized populations. Oral health diseases includes tooth decay, tooth erosion, gum disease, and oral cancer as well as facial and dental injuries. These diseases continue to be widespread despite being highly preventable. Simple measures such as improved oral hygiene practices, improved diet, use of and access to fluoride, along with attending the dentist for regular check-ups to identify problems early, can all help to prevent, or at least reduce, the burden of oral diseases.

Although oral health of the UK population has improved significantly over the last 30 years, inequalities have widened. Socio-economic and cultural factors are recognised as being key determinants of oral health inequalities. Functional and psychosocial problems associated with poor oral health are particularly marked in already vulnerable populations such as low-income groups. People in Nottingham have some of the highest levels of oral diseases compared to the National and England average. This can be attributed to Nottingham being a unique City in its high proportion of people from different ethnic backgrounds as well as children and young people; and those living in areas of deprivation, Nottingham is ranked 8th most deprived district in England in the 2015 Indices of Multiple Deprivation (IMD).

This health needs assessment (HNA) has been produced alongside the Nottingham City Oral Health Joint Strategic Needs Assessment (2017). The HNA takes a life course approach and aims to identify the oral health needs of Nottingham's populations, in order to further understand current and future demands, trends and pressures, and challenges citizens may face in achieving good oral health. The HNA makes recommendations to inform commissioning and local oral health strategy, via the Nottinghamshire Oral Health Strategy Group.

1. Introduction

Oral health is an integral part of general health and wellbeing. A healthy mouth and smile means that people can eat, speak and socialise being important in overall quality of life, self-esteem and social confidence. Poor oral health can result in significant pain and eventual tooth loss, with an adverse impact on school or, work, family and social life.

Oral diseases are largely preventable and variation in oral health exists between and within countries and regions. The Global Burden of Disease Study 2016 estimated that oral diseases affected half of the world's population (3.58 billion people). Dental caries (tooth decay) in permanent teeth was estimated to be the most prevalent health condition globally with severe periodontal (gum) disease estimated to be the 11th most prevalent disease globally¹. Unacceptable inequalities exist with more vulnerable, disadvantaged and socially excluded groups experiencing more oral health problems.

There are a range of conditions such as obesity, stroke, cancers, diabetes that share a set of common risk factors that also affect oral health (Fig 1.). These common risk factors are mainly diet, tobacco and alcohol. Tooth decay, gum disease and mouth cancer all share these common risk factors.

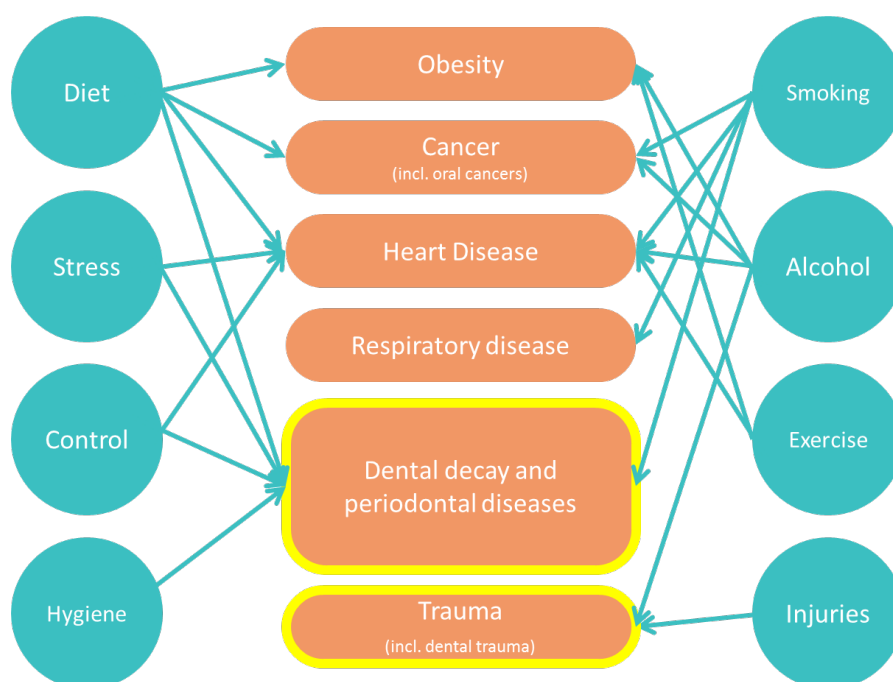


Figure 1. Common risk factor approach (Source: Sheiham & Watt, 2000²)

Nationally, there have been improvements in dental health and more people are keeping their teeth for longer as they age. This is, in part, likely to be attributable to the use of appropriate

concentrations of fluoride toothpaste, improvement in oral hygiene, less treatment interventions and a more minimal treatment approach by dentists, changes in dietary habits and diet, reduction in smoking and a real improvement in public interest and motivation.

Although advances in clinical operative techniques have made dental treatment more effective and acceptable, treatment approaches alone are not sufficient and the implementation of effective and appropriate prevention strategies is essential. Promoting better health involves developing and implementing a common risk factor approach, to healthy public policies, creating environments that support and encourage better health, strengthening communities and helping people to acquire knowledge and skills.

As with so much of public health, it is about more than the actions of the public health team or dentistry with many other healthcare, social care and local government departments having a role to play. Creating partnerships between other disciplines and forging alliances with organisations strengthens the spread of good practice and insight into how so many local policies and day-to-day decisions influence the oral health of the population.

1.1. Oral Health Needs Assessment (OHNA)

1.1.1. What is an OHNA?

An oral health needs assessment is a tool for identifying the oral health needs and oral healthcare needs of a population to target resources towards improving the oral health of those at specific risk or in underserved population subgroups. The process involves establishing and describing the oral health of a population, ascertaining their needs, reviewing the services commissioned to meet these needs and identifying gaps in provision and key issues to be prioritised and addressed within future work on oral health in the City.

1.1.2. Reason for an OHNA?

The restructuring of the NHS in April 2013 followed the passing of the Health and Social Care Act 2012. The Act conferred the responsibility for the commissioning of NHS dental services to NHS England and conferred the responsibility for health improvement, including oral health improvement to local authorities.

Local authorities now have a statutory requirement to assess their local population's oral health needs. An oral health needs assessment can help local authorities identify the oral health needs in their local communities for inclusion in the joint strategic needs assessment.

1.1.3. Local arrangements for the OHNA

This oral health needs assessment has benefitted greatly from input from various local stakeholders who have assisted the authors in writing this document and identifying recommendations to take forward. The Nottingham and Nottinghamshire oral health steering group provided accountability for the development of this needs assessment. This group will continue to meet after completion of this report, to monitor and co-ordinate the recommendations from this needs assessment.

1.1.4. Aim

To undertake an oral health needs assessment in Nottingham City to support the planning of oral health care services and oral health improvement services for the local population.

1.1.5. Objectives

- To describe the oral health needs in Nottingham City population
- To describe provision of oral health care services and oral health improvement
- To identify gaps in provision
- To make recommendations for the future development of high quality, evidence based and outcome focused oral health care and oral health improvement across Nottingham City.

1.2. National context

1.2.1. The Health and Social Care Act³

The Health and Social Care Act created a new commissioning framework for health, social care and public health in England. This has led to a significant re-shaping of the landscape. From April 2013, NHS England became the single commissioner for the totality of dental services including primary, secondary and unscheduled dental care. In addition, local authorities became responsible for improving the oral health of their communities and for commissioning oral health improvement services.

Statutory dental public health responsibilities of local authorities include:

- Securing the provision of oral health improvement programmes to improve the health of the local population, to the extent that they consider appropriate in their areas

- Securing the provision of oral health surveys to facilitate:
 - i. the assessment and monitoring of oral health needs
 - ii. the planning and evaluation of oral health promotion programmes
 - iii. the planning and evaluation of the arrangements for provision of dental services as part of the health service
 - iv. where there are water fluoridation programmes affecting the authority's area, the monitoring and reporting of the effect of water fluoridation programmes
- Participation in any oral health survey conducted or commissioned by the secretary of state; and
- Making proposals regarding water fluoridation schemes, including a duty to conduct public consultations in relation to such proposals and powers to make decisions about such proposals

From 1 October 2015 commissioning responsibility for the Healthy Child Programme for zero to five-year-olds transferred from NHS England to local government. This included the commissioning of health visitors, who lead and support delivery of preventive programmes for infants and children, including providing advice on oral health and on breastfeeding reducing the risk of tooth decay.

1.2.2. Oral health in England

Child oral health has improved and fewer children experience tooth decay than they did 30 years ago. However, national surveys still highlight inequalities which are strongly associated with social background. Dental caries is the most common disease of the dental tissues. It is the most common hospital diagnosis and the number one reason for admission to hospitals in children aged 5-9 years in England⁴. Dental treatment under general anaesthesia, often the only way to treat very young children and those with disabilities, presents a small but real risk of life-threatening complications for children. Prevalence of gum (periodontal) disease is low in children and oral cancers are considered to be rare in children⁵.

Similarly, adult oral health in England has been and still is, improving. More adults keep their teeth for life, which produces a challenge for dentistry to support people with an ageing dentition. Despite this, oral cancer incidence has risen, in part driven by historical smoking rates, increases in alcohol intake and the increases in human papilloma virus in women who did not receive the HPV vaccine.

NHS England's 'Improving dental care and oral health – a call to action'⁶ suggested the NHS in England spends £3.4 billion per year on primary and secondary care dental services, with over 1 million patient contacts within NHS dental services in England each week. Untreated decay, severe periodontitis, and severe tooth loss using disability adjusted life-years (DALYs) were estimated to affect 3.9 billion people and accounted for 15 million DALYs globally (~224 health years lost/100,000 population). In addition, poor dental health has societal costs due to missed days at work.

1.2.3. PHE, NHS and other government supporting materials

- Advancing our Health: Prevention in the 2020s⁷, was released for consultation by the UK Government in July 2019. This green paper includes proposals that would see more school tooth brushing schemes in pre-school and primary school settings in England; focusing on the most deprived areas first. The green paper also acknowledges evidence on the impact of water fluoridation on inequalities in oral health and proposes new potential funding mechanisms between local authority and NHSE.
- The NHS Long Term Plan⁸ commits to increasing earlier access for children at the very earliest age (Starting Well Core initiative and the Dental Checks by One campaign); oral/dental health checks for those with learning disabilities; and, improving oral health for vulnerable older adults in care home settings.
- Delivering better oral health: an evidence-based toolkit for prevention⁹, offers guidance to dental teams about the advice they should give and the actions they should take to be sure they are doing the best for their patients in preventing disease.
- Tackling poor oral health in children: local government's public health role¹⁰ provides guidance and case studies to guide local government's in their role in oral health improvement.
- Improving oral health: community water fluoridation toolkit¹¹ - a toolkit to help local authorities make informed decisions on whether to implement, vary or terminate a water fluoridation scheme
- NHS England's Outcome Framework (2015/16)¹² includes indicators relating to patient experience and access to primary care dental services. It also includes improving dental health indicators, one recording tooth decay and another indicator that looks at children aged 10 or under that have been admitted to hospital to have teeth out due to decay.
- What is Known About the Oral Health of Older People in England and Wales: A review of oral health surveys of older people¹³.

- NICE public health guideline PH55¹⁴ covers improving oral health by developing and implementing a strategy that meets the needs of people in the local community. It aims to promote and protect people's oral health by improving their diet and oral hygiene, and by encouraging them to visit the dentist regularly.
- The Eatwell Guide shows the proportions of different types of foods which are needed to have a well-balanced and healthy diet
- Change4Life is a dedicated website for advice and guidance for the whole the family, with a downloadable 'Sugar App' to help families find out how much sugar is contained in day-to-day food and drink items
- Smokefree and smiling: helping dental patients to quit tobacco¹⁵, is a toolkit with guidance to dental teams, commissioners and educators on how they can contribute to reducing rates of tobacco use
- Sugar reduction: evidence into action¹⁶ reported the findings of an earlier review of the evidence for sugar reduction and an assessment of the evidence based actions to reduce sugar consumption

2. Population and demographics

Nottingham City has tightly drawn city boundaries that encompass 28.81 sq mi (74.61 km²) including 20 wards. In 2017, it was estimated that 329,200 lived in Nottingham City, an increase of 4,400 since 2016. The city experiences a significant turnover of residents with 30,600 people arriving from elsewhere within the UK and 31,800 leaving.

Projections suggest that the population may rise to around 344,300 by 2027. International migration (recently from Eastern Europe) and an increase in student numbers are the main reasons for the population growth since 2001, together with the excess of births over deaths.

2.1. Population profile

2.1.1. Age

The latest mid-year estimates show that the City has a very high proportion (29.6%) of the population aged 18 to 29; full-time university students comprise about 1 in 8 of the population. The percentages in other age-groups are lower than the average for England, with the proportions of those between 65 and 79 being particularly low. The proportion of children is lower than the

England average, although not for under- 4s. This may indicate that birth-rates are comparatively high but also that a considerable number of children leave the City before starting school. Of the those aged 50+ living in the City, 55% are under 65; 24% aged from 65 to 74; and 22% aged 75 and over (Figure 2).

In the short to medium term, the City is unlikely to follow the national trend of seeing large increases in the number of people over retirement age, although the number aged 85+ is projected to increase.

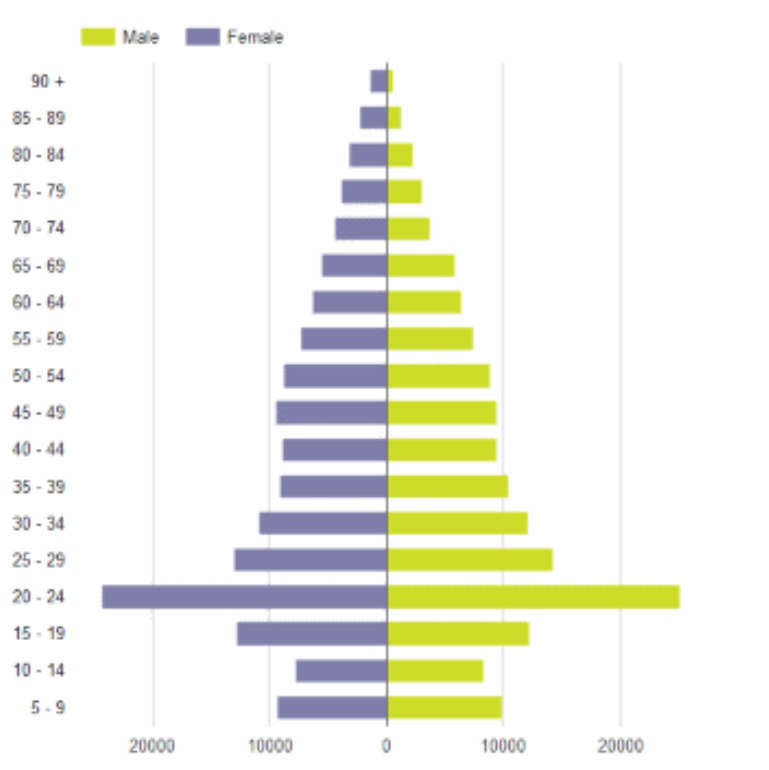


Figure 2: The population pyramid for Nottingham City (Source: ONS 2015)

2.1.2. Ethnic groups

The 2011 Census shows 35% of the population as being from BME groups; an increase from 19% in 2001. Between 2001 and 2011, the biggest changes in the ethnic 'make-up' of the city included an increase in the 'Other White' (2.5% to 5.1%), Mixed - White and Black Caribbean (2% to 4%), Black African (0.5% to 3.2%), and Pakistani (3.6% to 5.5%) populations (Figure 3). The largest groups other

than White British are now Pakistani (5.5%) and Other White (5.1%) – which will include large numbers of people from Poland.

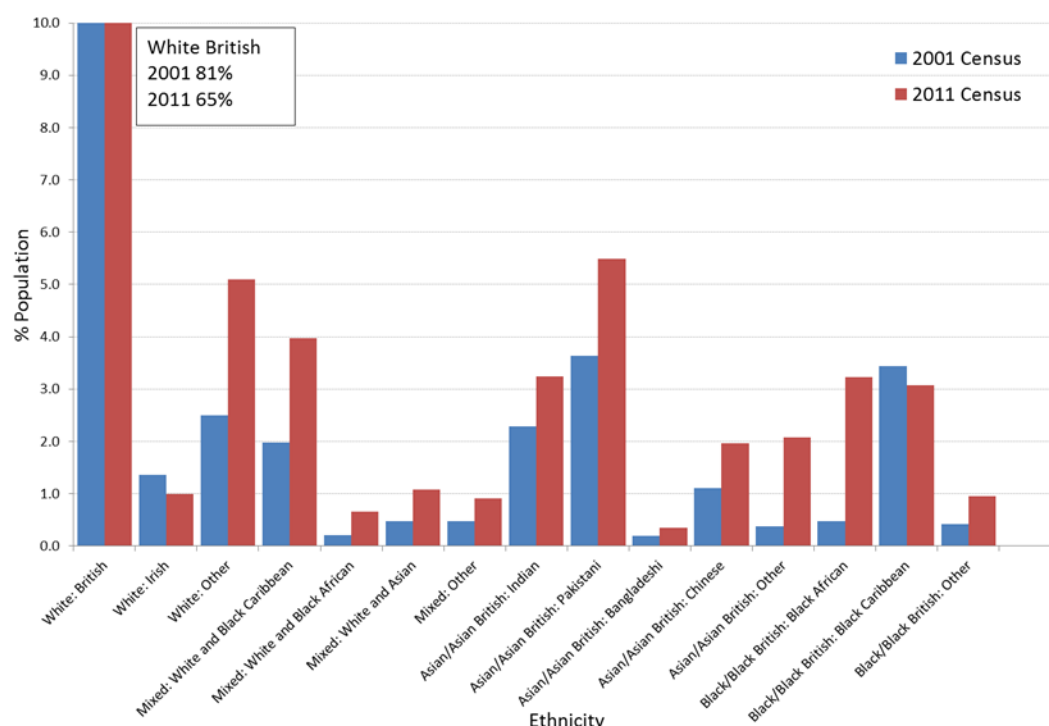


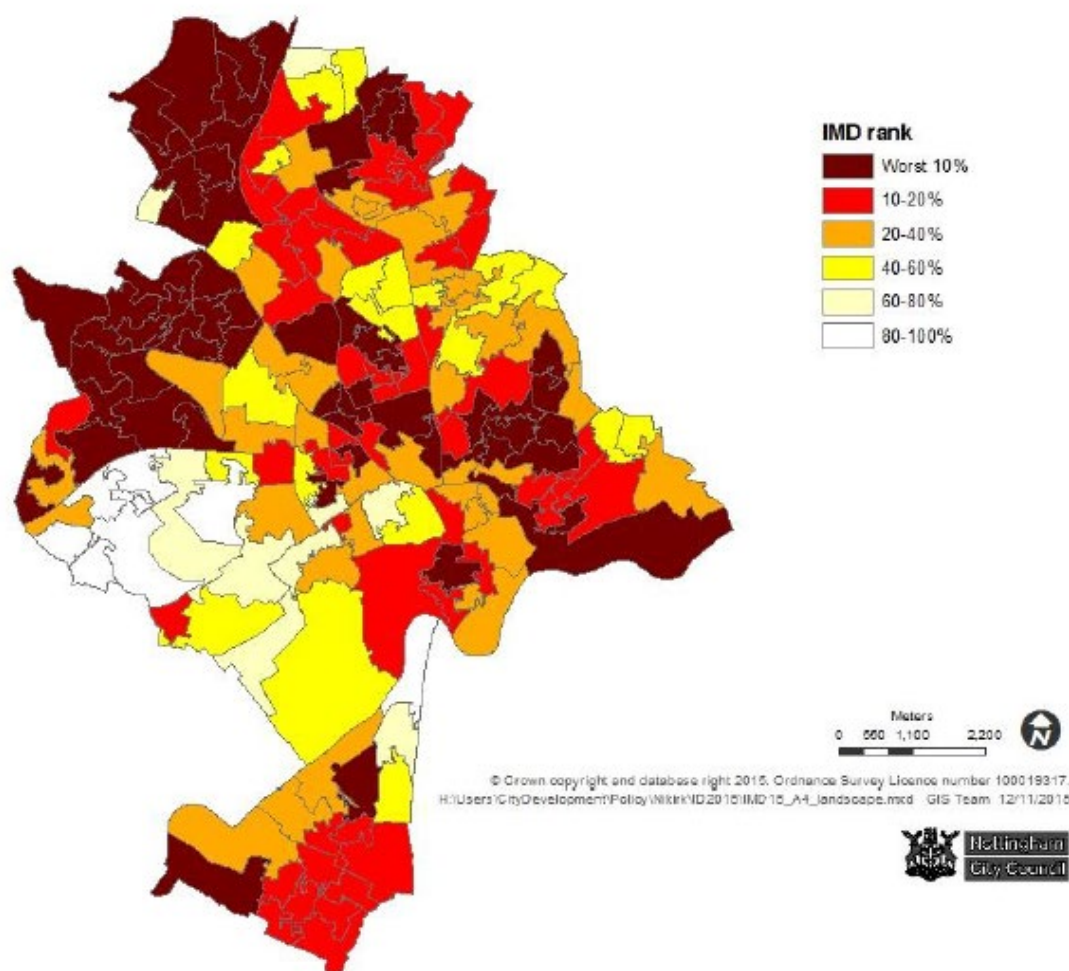
Figure 3: Change in proportion of the population from different ethnic groups between 2001 and 2011.

The population of pupils in the City’s educational provision also shows a varied picture, with 53.1% of pupils being members of BME groups (non White-British) in January 2017. This proportion has been rising in recent years from 37% in 2008¹⁷. Over a quarter (26%) of all pupils have a first language that is not English. This has risen from 18% in 2008.

Analysis of the 2011 Census shows that the main BME groups have quite different geographical distributions¹⁸ and in three Nottingham wards: Berridge; Leen Valley; and St Ann’s, the proportion of the population who are from Black and Minority Ethnic (BME) groups is more than 50%.

2.1.3. Levels of deprivation

Nottingham is ranked 8th most deprived district in England in the 2015 Indices of Multiple Deprivation (IMD), a relative fall from 20th in the 2010 IMD. In the Lower Super Output Area level results, 61 of the 182 City Lower Super Output Areas (LSOAs) fall amongst the 10% most deprived in the country for the Index of Multiple Deprivation (the overall measure of deprivation)¹⁹.



Map 1: Index of Multiple Deprivation by ward in Nottingham City

Nottingham City is ranked the fourth most-deprived area in England according to the Income Deprivation Affecting Children Index²⁰. Over 25,000 children (38%) live in poverty. In some areas of the city this figure rises to over half (Arboretum – 52%) yet in others it is below one in five (Wollaton West – 17%). In addition, 25.8% of people aged 60 and over are affected by income deprivation.

2.2. Health profile

2.2.1. Life Expectancy

Life expectancy is a measure of the estimated length of life for a particular population based upon current mortality rates. Life expectancy in Nottingham City is significantly lower than the England average, with approximately 3 years less for men and 2 years less for women (Nottingham: 77.0 men; 81.1 women. England: 79.5 men; 83.1 women). Nottingham's life expectancy between the most and least affluent areas differs by approximately nine years for men and eight years for women.

Year on year rises in life expectancy began to stall in 2010 with a recent decrease in overall life expectancy; largely driven by the reduction in female life expectancy since 2011-13. However, the decrease is small and not a statistically significant trend.

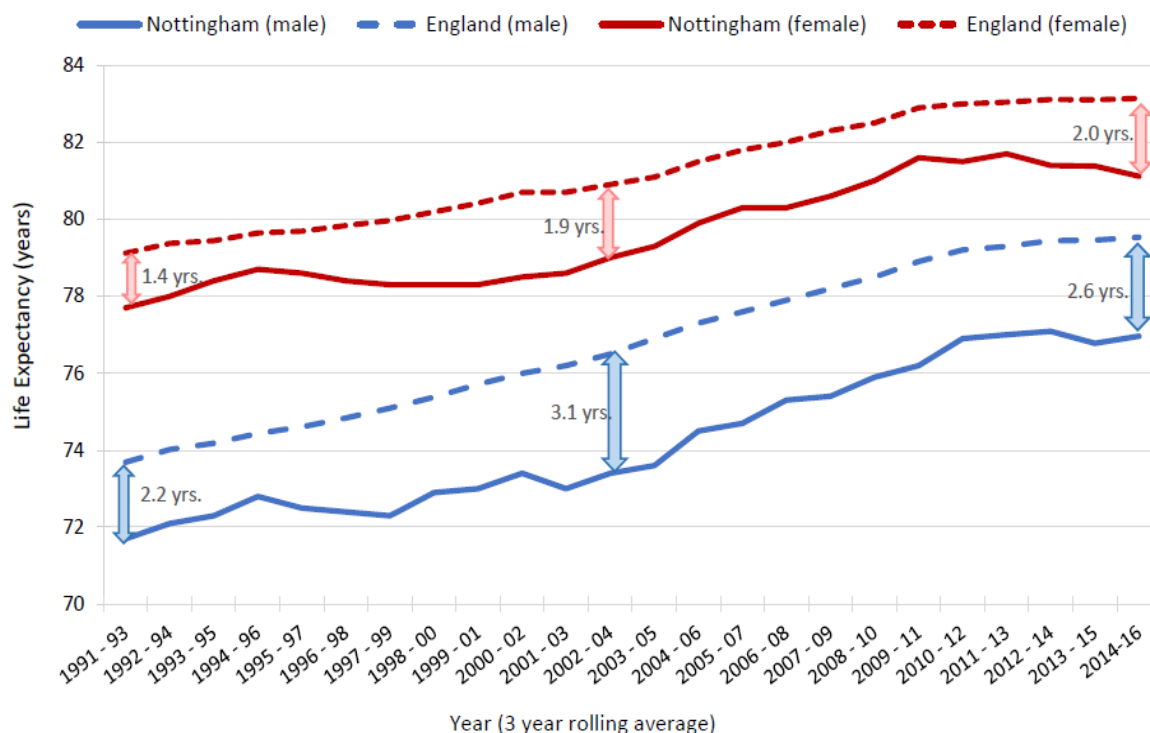


Figure 4. Life expectancy in Nottingham City men and women 1991-92 to 2014-16 and the gap to the average life expectancy in England.

2.2.2. Healthy Life Expectancy

Healthy life expectancy is a measure of the average number of years a person would expect to live in good health based on current mortality rates and prevalence of self-reported good health.

Nottingham's healthy life expectancy for both males (57.0 years) and females (53.5 years) is significantly lower than the national average (63.4 years for males and 63.8 years for females) in 2015-17. Healthy life expectancy between the least and most affluent areas of the city differs by approximately 12 years for men and 13 years for women (2009-13). Females born in Nottingham would expect to spend a greater proportion (34.1%) of life in poorer health compared males (26%).

2.2.3. Global Burden of Disease

The Global Burden of Disease (GBD) project aims to produce the best possible comparable estimates of ill health and injury around the world²¹. It is an annual global assessment of the health of populations, broken down by age, sex, country, and selected subnational geographical areas.

The GBD study is a standardised analytical approach for estimating life expectancy, disability-adjusted life-years (DALYs), and the risk factors responsible for the observed health burden²².

As of 2017, in Nottingham City, tobacco, dietary risks and high body mass index explain the majority of years spent in ill health by those living in the city²³. The leading causes of years of disability adjusted life years is now low back pain, ischemic heart disease and COPD.

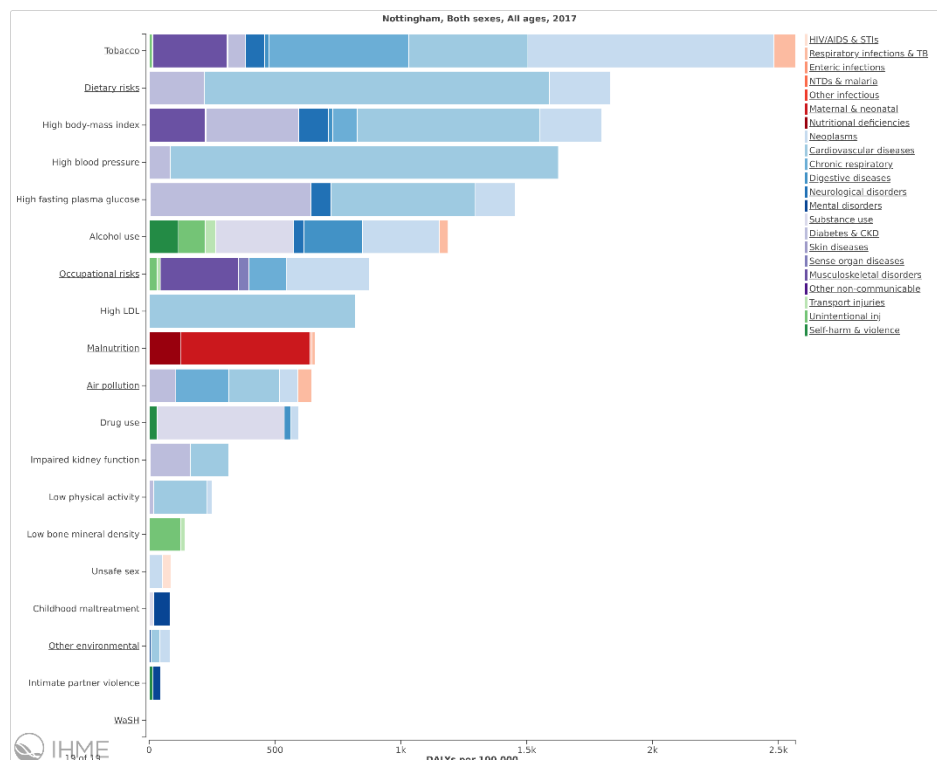


Figure 5. Risk factors explaining disability adjusted life years in Nottingham City (Source: Institute for Health Metrics and Evaluation, 2017²³)

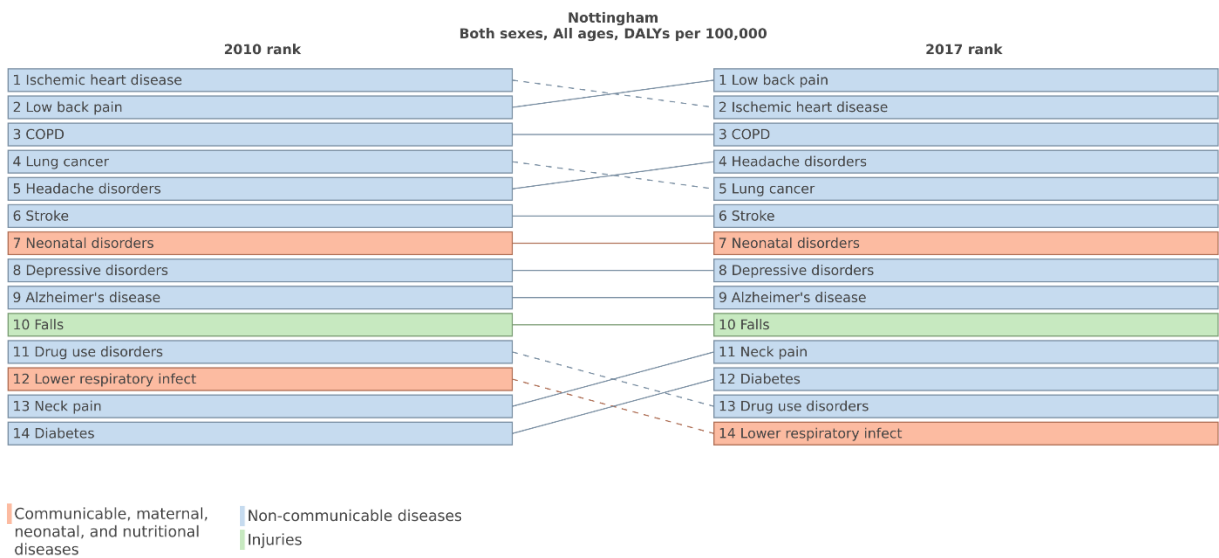


Figure 6. Causes of disability adjusted life years in Nottingham City in 2010 and 2017 (Source: Institute for Health Metrics and Evaluation, 2017²³)

2.2.4. Lifestyle risk factors relevant to oral health

2.2.4.1. Diet and nutrition

While there is no one, universal ‘healthy’ diet that suits all individuals there remain core principles that can help individuals protect their oral health. Sugars are the most important dietary factor contributing to dental caries and the evidence is strong of the association between dental caries and the daily total amount of sugar consumed²⁴ together with the frequency of consumption of sugar containing food, drinks and snacks.

All sugars can cause decay. While fruit does contain natural sugar and acids, which can erode your teeth, they only damage teeth if eaten in an unusually large amount. However, when fruit is juiced or blended, as in smoothies, the sugars are released from the structure of the fruit and it is recommended that no more than 150ml of fruit juice or smoothies be consumed per day.

The National Diet and Nutrition Survey (NDNS) provides details each year on food consumption, nutrient intake and nutritional status of the general population. On average in England, consumption of free sugars has reduced significantly in children of all ages since 2008, but particularly in those aged 11-18 years. While consumption of sugar-sweetened beverages has, on average, reduced

amongst children in England over the last 10-years, they remain a major contributor to children's free sugar intake. Intake of free sugars and sugary drinks among adults also showed a downward trend in the past 10-years, although to a much lesser degree²⁵.

There is little data on food/nutrient intake at a local level; however, only half of adults (52.6%) meet the recommended five or more portions of fruit or vegetables a day; a marker of overall diet quality.

2.2.4.2. Obesity

Dentistry for obese patients can pose challenges: some of these are well-documented such as the increased likelihood of periodontal disease in obese patients²⁶. Other potential complications, including those associated with conscious sedation, are less well described. Being overweight is linked to a number of health and social problems, which may in themselves affect access to dental services and dental management.

In 2017/18, two in every five children (40.8%) in Nottingham City are overweight or obese by the time they leave primary school; the equivalent of 61 standard sized classrooms. Nottingham City has the 16th highest prevalence of obesity in Year 6 children in England. However, this issue is born much earlier in the life course with more than one in four (26.7%) children in reception being overweight or obese, in Nottingham. These headline figures tell only part of the story with great variation across Nottingham's communities; those living in the most deprived areas are significantly more likely to be obese than children in the least deprived areas. In addition, almost two thirds (61.6%) of adults were estimated to be overweight or obese in 2016/17²⁷.

2.2.4.3. Type 2 Diabetes

Oral health and Type 2 diabetes have strong links in both directions. Studies show a greater prevalence of periodontal disease amongst individuals with diabetes compared to healthy individuals^{28,29} with a two-fold higher risk of developing periodontal disease compared to those without diabetes³⁰. Individuals with poorly controlled type 2 diabetes have an exaggerated inflammatory response that when coupled with impaired wound healing and repair may lead to destruction of the periodontal tissue. In addition, the chronic inflammatory state induced by untreated periodontitis may contribute to insulin resistance with treatment leading to improvements in type 2 diabetes control³¹.

2.2.4.4. Breastfeeding

Breastfeeding provides the best nutrition for babies and promotes good health³². It should be promoted as a norm with support provided for those experiencing difficulties. Breastfeeding up to 12 months of age is associated with a decreased risk of tooth decay^{9,31}.

From six months of age infants should be introduced to drinking from a free-flow cup, and from age one year feeding from a bottle should be discouraged⁹. Persistent use of baby feeding bottles and use of non-free flow cups, particularly if they contain sweetened liquids are associated with increased risk of tooth decay.

Sugar should not be added to weaning foods or drinks⁹. Parents need to be supported to make considered choices when weaning children. Most commercially produced weaning foods contain higher levels of added sugars and sweeteners than home prepared food.

In 2017/18, 72.4% of mothers in Nottingham City breast-fed at birth, lower than the national average of 74.5%³⁵. However, breastfeeding rates at 6 weeks are better than the national average; 47.3% in Nottingham compared to national average of 42.7%. Nottingham has the fourth highest 6-week breastfeeding rate of its statistical neighbours³⁵.

2.2.4.5. Tobacco Smoking

Smoking increases the risk of developing laryngeal and oral (mouth) cancer. The reported pooled cancer risk estimate was 3.43 (95% CI 2.37, 4.94) times higher in smokers compared with non-smokers³⁶. A meta-analysis has shown that the risk of oral cancer associated with bidi^a smoking is about three times higher compared with cigarettes.

Smoking has also been associated with greater risk of periodontal disease and a dose-dependent association with increased rates of tooth loss i.e. greater risk in heavier smokers over previous and never smokers. Cigar and pipe smoking are also likely to be related to tooth loss risk, but very few studies have investigated this hypothesis. Smoking may also cause brown/black discolouration of

^a Small hand-rolled cigarettes made of tobacco and wrapped in tendu or temburni leaf (plants that are native to Asia)

teeth, alteration of taste, and delayed wound healing after surgical procedures such as tooth extraction

Former smokers have smaller risks of tobacco-related oral diseases than current smokers. While marked benefits of smoking cessation can be expected in the short-term, it may take several years of abstinence for the risk to decline to that of never smokers.

In Nottingham City, the trend of reducing prevalence of current smokers observed nationally has been mirrored up to 2017 but plateaued in 2018 (Figure 7)³⁷. The proportion of adults who are current smokers in Nottingham City (19.4%) remains significantly higher than England (14.9%)³⁷.

Nottingham has higher rates of lung cancer, chronic obstructive pulmonary disease, heart disease and other smoking-related conditions compared to England. In 2015, it was estimated that smoking costs Nottingham City Council an additional £3 million each year in care provision. The total annual cost of smoking-related ill health to the then Nottingham City Clinical Commissioning Group, the NHS Trusts and commissioned providers was estimated at £11 million³⁸.

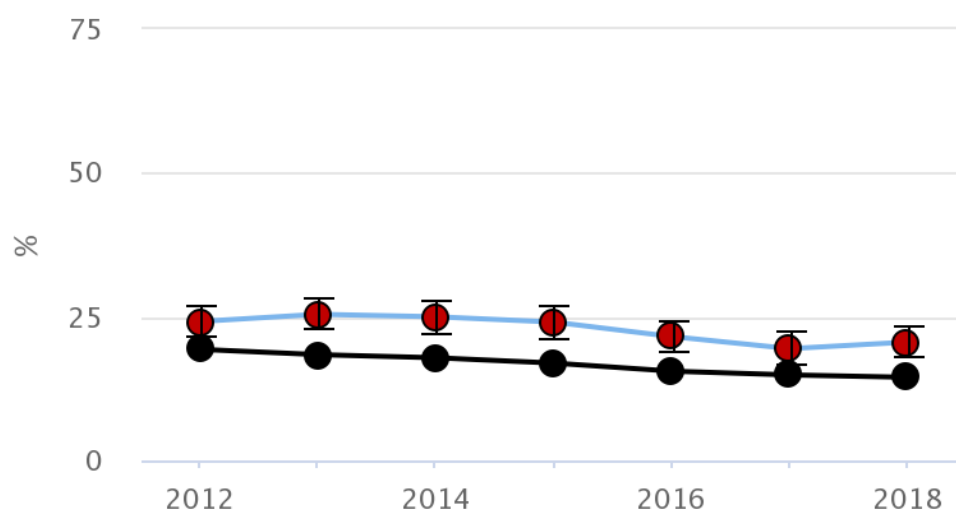


Figure 7. Prevalence of current smokers in adults in Nottingham (red) and England (black)

The prevalence of shisha smoking and usage in the city is not known. It is possible that improvements in oral health outcomes due to reduced cigarette smoking will be impacted by the increasing popularity of Shisha.

The number of public establishments where people can smoke shisha is monitored through City Council Environmental Health. Establishments should comply with the smoke-free legislation which does not permit smoking inside in enclosed or partially enclosed public places or workplaces. However, shisha is also smoked in homes, with shisha tobacco and pipes available via home delivery.

2.2.4.6. Alcohol

Harm caused by the consumption of alcohol is one of the main contributing factors of premature death and disability. Alcohol consumption contributes to more than 60 diseases and conditions including cardiovascular disease, liver diseases and cancer³⁹.

Alcohol consumption has been linked to increased risk of head and neck cancer⁴⁰. However, impacts on oral health are broader than this with impacts on dental erosion due to the acidic components of alcoholic drinks; and dental trauma due to social disorder, violence and accidental falls. In addition, rates of dental caries and periodontal disease are higher among chronic alcoholics⁴¹ who may neglect oral hygiene and diet.

New guidelines for safer alcohol consumption were published in 2016⁴². These recommend that men and women should not regularly drink more than 14 units of alcohol per week. People who do drink as much as 14 units should spread this out evenly over a period of at least three days and pregnant women or women planning a pregnancy should not drink alcohol.

Alcohol harm represents a significant public health burden in Nottingham City. The city has some of the worse outcomes for alcohol related harm in England. Results from the 2016 Nottingham Citizens survey indicate that 64.1% of respondents drink alcohol (an increase from 60.2% in 2015), although this varies across the city⁴³. Of those who reported drinking in Nottingham, 13% of people are at higher or increasing risk of developing alcohol related health problems and 25% binge drink, again with geographic variation. There are an estimated 5,515 dependent drinkers in Nottingham city⁴⁴.

Nottingham city has statistically significantly higher rates of admission for alcohol related conditions (1000 per 100,000 compared to 647 per 100,000 for England), for alcohol specific mortality (19.2 per 100,000 compared to 10.4 per 100,000 for England). A conservative estimate of costs of alcohol-related hospital admissions for Nottingham City have been estimated at £4.72m per year⁴⁵.

2.2.4.7. Substance misuse

Drug misuse is associated with a range of psychological, physical and social issues and addressing these remain a key national and local priority. Drug users comprise a group with special dental needs and need greater access to dental care than most people. Drug abuse is associated with serious oral health problems including tooth decay, gum disease and other oral diseases⁴⁶. The lifestyles of drug users may contribute to oral health problems and low use of services⁴⁷.

Whilst solid progress has been made in improving the impact of drug misuse, the changing nature of drug misuse represents further challenges for Nottingham City.

Nottingham has similar levels of substance misuse compared to other major cities in the country. For example, there are an estimated 2,615 opiate and crack users in Nottingham, this is the lowest rate of the three cities in the East Midlands (including Nottingham, Leicester and Derby) and mid-table within the eight Core Cities.

2.2.4.8. Mental Health

Mental health problems range from severe mental illness, such as schizophrenia to common mental health problems such as anxiety and depression. All these conditions can be highly disabling and affect family, working and social life.

A strong interaction exists between oral health and mental health. In one direction, about one half of all dental patients experience some anxiety about their dental visits, and in some cases this leads to dental phobia, a form of specific phobia⁴⁸. Perception of dental pain may also be exacerbated by depression or anxiety, regardless of the degree of oral pathology. In the other direction, psychiatric illness can lead to poor oral health. People with mental illness, particularly severe mental illness, are at greater risk of oral health problems because of poor nutrition and oral hygiene; the heavy consumption of sugary drinks; comorbid substance misuse including tobacco, alcohol, or psychostimulants; and financial or other barriers to accessing dental care.

The Child and Maternal Health Observatory (CHiMAT) estimates suggest, on average, in England, 9.2% of children and young people aged 5-16 had a mental health disorder. Local figures are based on applying national prevalence data to local population estimates and suggest 10.6% of Nottingham

City's 5-16 year olds have a mental health disorder. Nottingham City has a rate of hospital admission for self harm in 10-14 year olds above the national average at 349.9 per 100,000 children⁴⁹.

Public Health England (PHE) estimate that the prevalence of common mental health disorders in the 16 to 74 year old population of Nottingham City is 17.2%⁵⁰. This is the highest prevalence in the North Midlands NHS region and is above the England average (15.6%). The prevalence of Common Mental Health Disorders in Nottingham City is below the average of its ten most similar (demographically) CCGs.

The Citizen's Survey in Nottingham offers an indication of wellbeing amongst Nottingham City citizens. It also shows small variations, in-line with the national picture, between different demographic groups e.g. well-being is lower in those of working age, with disability or long-term illness and who are unemployed.

2.2.4.9. Learning disabilities

Children and young people with special educational needs and disabilities are a broad and diverse group and include individuals with complex needs requiring multi-level support as well as those who require substantially less input⁴⁹.

There is evidence that people with learning disabilities experience poorer general and oral health, have unmet health needs and have a lower uptake of screening services⁵¹. The Long Term Plan includes a commitment to increasing oral health checks for people with learning disabilities⁸.

The barriers to oral health that people with a learning disability experience will vary by age and the level of parental or social support received. An individual's physical, mental and cognitive ability to carry out effective oral hygiene, make choices about healthy eating, seek dental services or co-operate with treatment, are factors that influence oral health.

Data available on oral health status for children and adults with a learning disability relates mainly to specific groups. However, the overall picture is one of poor periodontal health and a greater than normal unmet need of treatment for children and adults. Oral health may be further complicated by medical or behavioural factors and their treatment⁵¹.

The number of disabled children (0-18 years) in England is estimated to be between 288,000 and 513,000⁵². Chief Medical Officer estimate that 0.8 million disabled children and young people, aged 0 - 18 (6%) live in the UK. The mean percentage of disabled children in English local authorities has

likewise been estimated to be between 3.0% and 5.4%⁵³. If applied to the population of Nottingham this would equate to between 1,978 and 3,560 children experiencing some form of disability⁵². There is a degree of overlap between children with special educational needs and those with a disability⁵². Overall, the prevalence of disability is lower than the prevalence of SEN as not all children with disabilities will have special educational needs.

There were 3210 young people (0-24 years) who claimed disability Living Allowance. Of these, over half had conditions that indicate additional special educational needs. Bilborough has the highest DLA claim rate (70 per 1000 children aged under 16 years)⁵².

2.2.4.10. Care homes/residential care/support from social care

The 'active ageing' policy framework proposed by the World Health Organization (WHO)⁵⁴ states that structural barriers present within the health and social care, employment and education sectors should be removed to allow ageing to be a positive experience. It recognises the rights of older people to equality of opportunity and treatment in all aspects of life.

Aligning health, workplace, education and social policies to support active ageing can address the social and economic challenges posed by an ageing population and broaden the opportunities for increasing participation and contribution.

Good oral health is an essential component of active ageing. Social participation, communication and dietary diversity are all impacted when oral health is impaired. Significant gains in oral health have been made in the last 30 years and the majority of older people now retain some natural teeth.

However, as in other sectors, for the benefits of improved oral health to be fully realised, structural barriers built into the existing dental and social care systems need to be removed with the aim of creating an equitable and responsive system that can deliver prevention and treatment for all, in proportion to their need.

PHE's Commissioning Better Oral Health for Older Vulnerable Adults⁵⁵ recommends that entry to care homes is a key event in the life course where there is a risk of rapid decline in oral health. This can impact on independence, care packages and social care costs. Poor oral health at this stage in life is also associated with risks of infection, malnutrition, aspiration pneumonia and, ultimately, avoidable hospital admissions and poor end of life care⁵⁵.

A CQC report⁵⁶ on the state of oral health care in care homes across England, concluded that care home residents were not being supported to maintain and improve their oral health. The report found:

- most care homes had no policy to promote and protect people's oral health (52%)
- nearly half were not training staff to support daily oral healthcare (47%)
- 73% of care plans reviewed only partly covered or did not cover oral health
- it could be difficult for residents to access dental care
- 10% of homes had no way to access emergency dental treatment for residents.

3. Oral Health Need

3.1. Children

Surveys of child dental health are undertaken as part of the Public Health England (PHE) Dental Public Health Intelligence Programme. Further information on the surveys is available through the [PHE Oral Health Collection](#) of resources on the gov.uk website.

3.1.1. Three-Year-Olds' Survey (2012/13)

- 255 three-year-old children resident in Nottingham City were examined.
- The mean number of teeth affected by dental decay amongst the children examined was 0.5 teeth. This is greater than the mean for the East Midlands and England (0.43 and 0.36 respectively).
- 16.5% of the children examined in Nottingham City were found to have experience of dental decay with an average of 3.05 affected teeth.
- 4.2% of the children examined had experience of early childhood caries (aggressive form of decay affecting the upper baby incisor teeth).
- Relationship to deprivation not as strong as that seen in five year olds

Table 1: Oral Health of Three Year Old Children 2012/13. Source: PHE⁵⁷

	Nottingham City	Nottinghamshire County	East Midlands	England
Percentage with decay experience	16.6%	11.1%	15.3%	11.7%
Percentage with active decay	16.1%	9.5%	14.7%	11%
Percentage with Early Childhood Caries	4.2%	2%	3.7%	3.9%

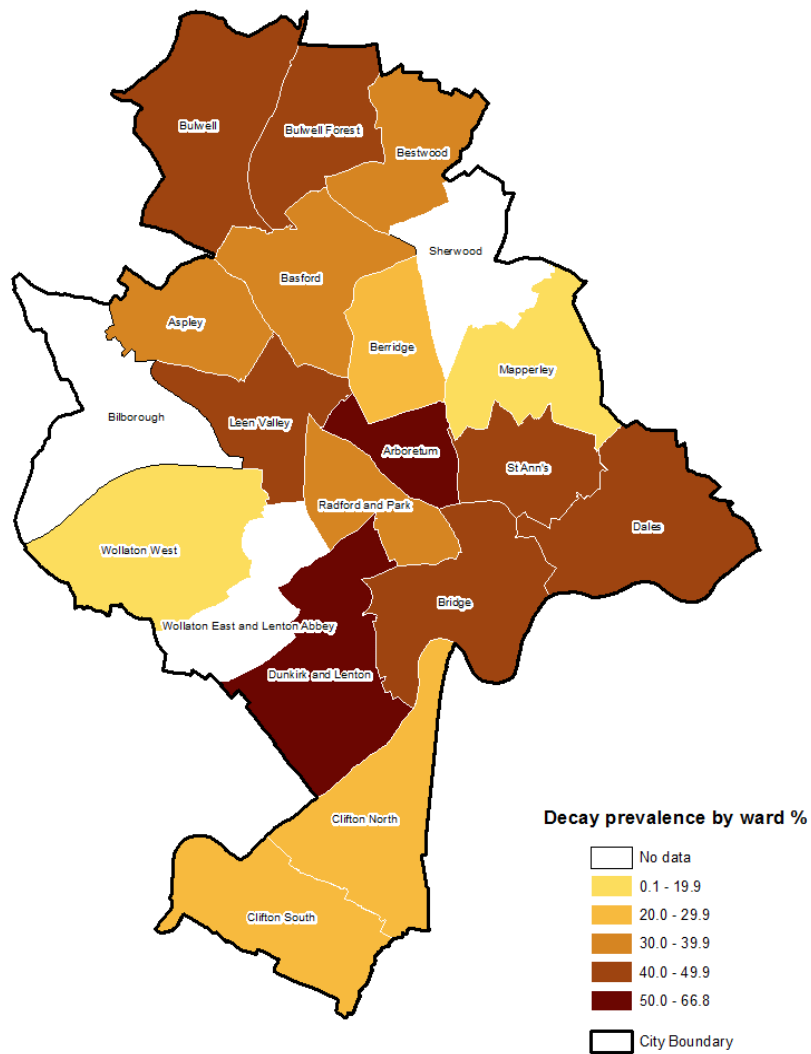
3.1.2. Five-Year-Olds' Survey (2016/17)⁵⁸

- 208 three-year-old children resident in Nottingham City were examined.
- The mean number of teeth affected by dental decay amongst the children examined was 1.22 teeth. This is greater than the mean for the East Midlands and England (0.84 and 0.78 respectively).
- 25.9% of the children examined in Nottingham City were found to have experience of dental decay with an average of 4.40 affected teeth.
- 4.2% of the children examined had experience of early childhood caries (aggressive form of decay affecting the upper baby incisor teeth).
- Compared to 2014/15 the proportion of children experiencing dental decay has reduced but the average number of teeth affected has increased.
- Experience of dental decay correlates with deprivation

Table 2: Oral Health of Five Year Old Children 2016/17. Source: PHE, 2018

	Nottingham City	Nottinghamshire County	East Midlands	England
Percentage with decay experience	25.9	20.9	25.1	23.3
Percentage with active decay	23.9	17.0	22.1	20.0
Care index	3.5	12.0	11.9	11.8

There is considerable variation in the prevalence of tooth decay at the area committee/ward levels in the City (Map 2). Local Area Committee 3 comprising Aspley, Bilborough and Leen Valley has the worse prevalence of tooth decay among 5-year olds in the City (Figure 8).



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Map 2: Percentage of 5-Year-Olds Free From Tooth Decay in Nottingham by wards (Source: PHE 2016/17)

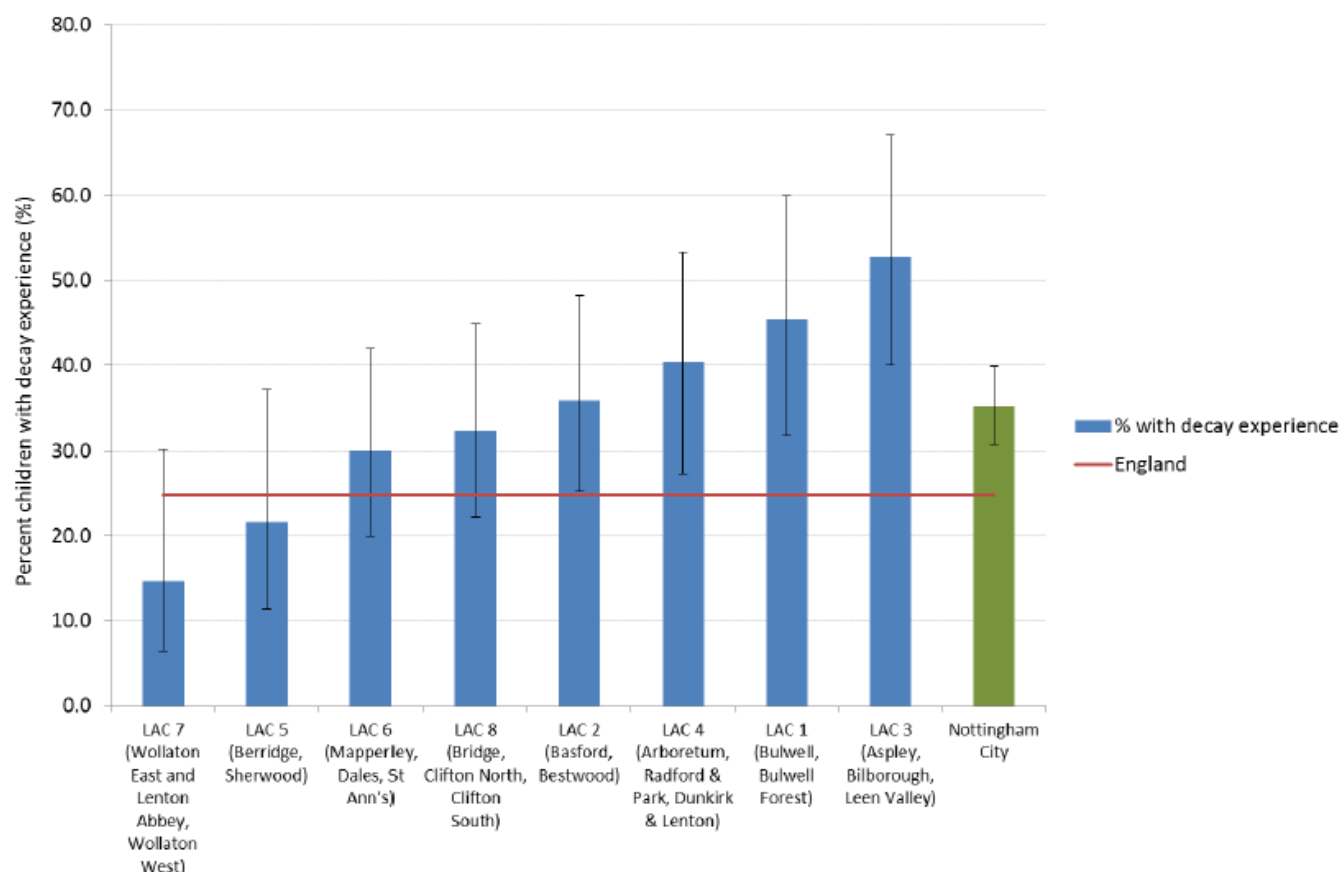


Figure 8: Percentage of 5-Year-Olds with Tooth Decay Experience by Area Committee (Source: PHE 2016/17)

3.1.2.1. Oral hygiene

The number of children with substantial amounts of plaque at the time of the examination provides a proxy measure of children who do not brush their teeth or brush them irregularly. In addition, such children will not benefit from the protective effects of fluoridated toothpaste. A 'Substantial amount of plaque' was recorded for 0.3% of children examined (compared to 1.5% across England). This data suggests that messages about good oral hygiene practices are being heeded by the population, however it should be recognised that the children for whom positive consent was not given for survey participation could have poorer oral health and hygiene.

3.1.2.2. Dental sepsis

At the age of five-years, nearly all sepsis will be the result of the dental decay process rather than originating from gum problems. A small number of cases will be linked to traumatic injury of teeth, but no diagnosis was recorded during this survey. The prevalence of dental sepsis for the sample of 5 year old children living in Nottingham examined (1.4%) is higher than the East Midlands and England (1.1%) averages but not statistically significant due to low numbers.

3.1.3. Twelve-Year-Olds' Survey (2008/09)⁵⁹

- 423 twelve year old children resident in Nottingham City were examined.
- The mean number of teeth affected by decay amongst the children examined was 0.87 teeth. This is greater than the mean for the East Midlands and England (0.74 and 0.74 respectively).
- 36% of the children examined in Nottingham City were found to have experience of dental decay with an average of 2.43 affected teeth.
- Experience of dental decay correlates with deprivation.

Table 3: Oral Health of Twelve Year Old Children 2008/09. Source: NHS, 2010

	Nottingham City	East Midlands	England
Percentage with decay experience	36%	33.2%	33.4%
Percentage with active decay	22.8%	17.9%	17.5%
Percentage with one or more fillings	42%	48%	47%

The 2013 United Kingdom children's dental health survey shows that significant numbers of front teeth are permanently damaged as a result of trauma with around one in ten children having sustained dental trauma to their incisors (12% at age 12 and 10% at age 15). At all age groups boys tend to damage their teeth more often than girls, however in this survey 12 year old boys were twice as likely as the same age girls to sustain damage to their teeth. The most commonly damaged teeth are the upper incisor teeth⁶⁰.

3.1.4. Children Attending Special Support Schools (2014)⁶¹

In 2014, Public Health England Dental Public Health Intelligence Programme carried out a survey of 5 and 12 year olds who attend special support schools in England. There is no comparative data as this is the first time a survey of this group has been undertaken, however the criteria and methodology used is the same as that for the 5 and 12 year old surveys of children attending mainstream schools.

In total, 149 local authorities out of 152 took part in the survey. In only 14 local authorities were sufficient 5 and 12 year olds examined to produce a valid estimate, therefore the East Midlands region is compared to England.

3.1.5. Five-Year-Olds' in special schools (2013/14)

The survey demonstrates that the dental health of five year old children attending special schools in the East Midlands is better than that for England. Across the East Midlands 107 five year olds were examined, of which 15% had experience of dental decay (England 22%), with an average 0.48 teeth affected by decay (England 0.88 teeth). Of those children with decay the average number of teeth affected in the East Midlands is 3.19 teeth (England 3.9 teeth). However, caution is urged when interpreting these findings as the sample size is based on a relatively small number of children.

Oral cleanliness amongst the children examined in the East Midlands was similar to the national picture with substantial amounts of plaque being recorded for 4.7% of 5 year olds in the East Midlands compared with 4.3% in England.

3.1.6. Twelve-Year-Olds' in Special Schools (2013/14)

In the East Midlands 34.1% of 12 year old children attending special schools have dental decay (England 29.2%), with an average of 0.9 teeth affected per child examined (England 0.69). However the mean number of teeth affected in the children with decay are 2.63 (England 2.37). Again although higher than the England average, this is based on a sample size of less than 20 children, so caution is urged when interpreting this data.

Oral cleanliness amongst the 12 year old children examined was poorer than that found amongst five year olds, with substantial amounts of plaque found in 19% and 19.5% of 12 year olds examined in the East Midlands and England respectively.

3.1.7. Looked after children

Under the Children Act (1989), a child is legally defined as 'looked after' by a local authority if he or she is provided with accommodation for a continuous period of more than 24 hours or is subject to a care order or a placement order. Statutory guidance requires that all children should receive an oral examination, including very young children, even if their teeth have not yet developed, and that they should have access to dental treatment⁶². Nottingham City has the highest proportion of children (0-18 years) in care, 89 per 10,000 in the East Midlands⁶³.

Many children in care come from families from lower socio-economic groups, and it can therefore be anticipated that they may already be experiencing poor oral health, or be at risk of poor oral health⁶⁴. In addition they are more likely to have greater health needs than their peers from the equivalent socio economic groups, resulting in significant health inequalities for children in care.

Local authorities are required to provide data annually to the Department for Education (DfE) about children in care. This includes a range of health data, but the only dental indicator recorded is the number of children who had their teeth checked by a dentist during the twelve month reporting period⁶⁵.

In 2015/16, the proportion of looked after children in Nottingham who were seen by a dentist was slightly higher than the National and East Midlands average of 58% and 52% respectively (Figure 9). However, compared to the statistical neighbour group average of 65%, a lower proportion of children were seen by a dentist in Nottingham (59%).

Regionally, there are variations in the proportion of looked after children seen by a dentist with less than 40% seen in Nottinghamshire and over 60% seen in Derby , Lincolnshire and Leicester.

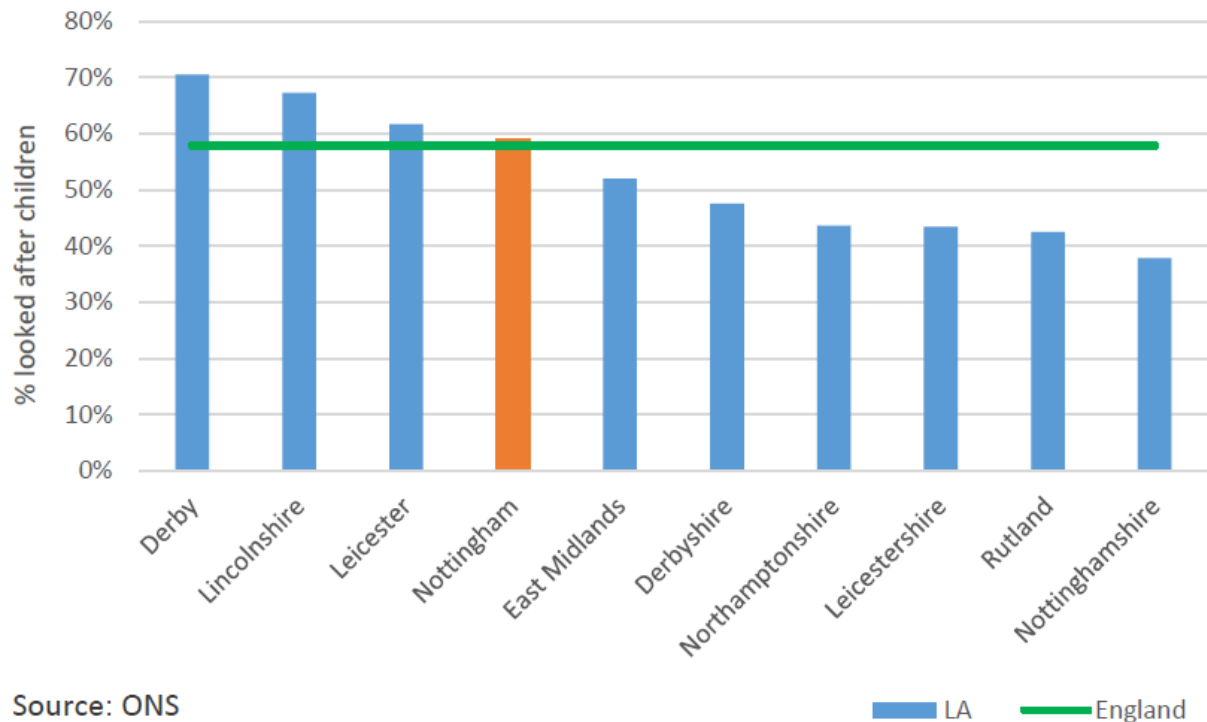


Figure 9: Percentage of Looked-after Children Seen by a Dentist, 2016

3.1.8. General Anaesthetics

Very young children or some children with special needs are unable to co-operate with treatment under local anaesthetic or sedation and often have no alternative but to undergo a general anaesthetic to have their multiple diseased teeth removed. All dental general anaesthetics have to be carried out in a hospital setting. These patients are not reflected in the extraction data from dental practices.

Nationally, the latest data from academic year 2017 to 2018 shows 7% (59,314) of hospital episodes of 0 to 19 year olds involved dental extractions. Dental extraction is the most common reason for 6 to 10 year olds to be admitted to hospital and the majority (65%) of these extractions are due to decay. Data is organised by local authority of child's residence and grouped by region (Figure 10). It suggests a slightly lower proportion of 0-19 year olds having extractions under general anaesthetic extractions than some parts of the UK. This variation is complex with numerous factors including water fluoridation influencing the need for extractions.

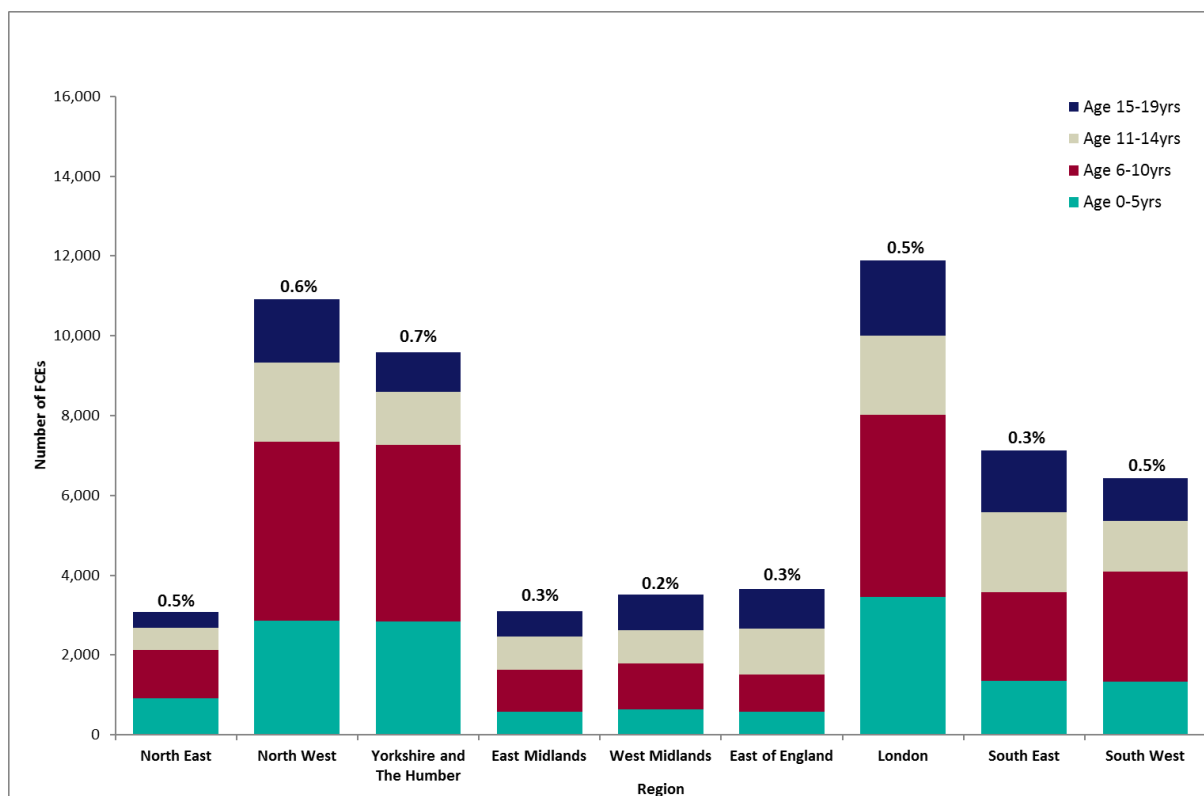


Figure 10: Number of children with hospital episodes for extraction of teeth for 2017-2018 including the percentage of population by region (above the bars).

A total of 450 dental extractions were carried out in children aged between 0 and 18yrs in Nottingham City between 2012 and 2016, averaging 90 dental extractions per year. However, this analysis, completed using Hospital Episode Statistics, under-estimates the number of children receiving general anaesthetics for the extraction of teeth in Nottingham as historically, this has not included those receiving care through the Community Dental Service.

3.2. Adults

There is a lack of local information on adult oral health. Most information on adult oral health is provided by reports in the Adult Dental Health Survey (ADHS) which is undertaken every ten years. The results of the most recent ADHS in 2009 demonstrated an improvement in most of the indicators of oral health and disease nationally. However, the same evidence also highlighted serious underlying social inequalities, particularly between poverty and oral health.

The headlines for England were⁶⁶:

- The proportion of edentulous adults (no natural teeth) fell from 37% in 1968 to 6% in 2009 – a major change within the timeframe of a generation.
- For dentate adults (with teeth), periodontal (gum) disease remains a significant problem with only 17% of adults having “very good” periodontal health.
- 23% of adults reporting dental pain had one or more teeth affected.
- The highest prevalence of decay was in the age-group 25 to 34 years (36%).

3.2.1. Adults in contact with domiciliary care dental care services (2010/11)

During 2009/10 and 2010/11 a survey of the dental health of adults in contact with domiciliary care dental services was undertaken. Compared to their same age peers in the adult dental health survey (2009), adult users of domiciliary care has worse oral health⁶⁶:

- Compared to the adult oral health survey (2009), more volunteers in the survey in contact with domiciliary care had no natural teeth (31% v 6%).
- Overall 9% of dentate adults in England who took part in the ADHS reported having a problem or pain in their mouth at the time of examination, compared with 14% of the domiciliary care volunteers.
- Among the domiciliary care volunteers 43% reported that they brushed twice or more a day, 41% said they brushed once a day, 11% less than once a day and 3% said they never cleaned their teeth.

3.2.2. Adults with learning disabilities (2010/11)

During 2009/10 and 2010/11 a survey of the dental health of adults with learning disabilities was undertaken. For many measures there is apparent comparability between the ADHS results and those found for adults with learning disabilities⁶⁷:

- There was variation in the mean number of teeth present with adults with learning disabilities having fewer teeth present than their same age ADHS volunteers. This difference increased in older age groups.
- A slightly higher proportion of adults with learning disabilities reported having at least one oral health problem that caused difficulty with eating, speaking, relaxing, being sociable or doing normal jobs in the past 12 months, compared to the adult survey (41% v 33%).

- A lower proportion of adults with learning disabilities reported brushing twice daily (63% v 75%), receiving advice on self-care from the dentist (17% v 47%), having an X-ray (20% v 34%) or having a filling (18% v 28%) during their last course of treatment compared to those in the general adult survey.

3.2.3. Older People in Care (2015)

Older people are also at increased risk of dental disease. Compounded with this increased risk, they are also more likely to have general health complications that make dental treatment planning more difficult and may require modification of dental services.

Little is known about the oral health of older people who are living independently at home or being cared for by friends, family or carers but PHE has undertaken a review of data on oral health of older people who live in residential and nursing care homes in order to gain an insight into their oral health needs. The main findings are as follows⁶⁸:

- Signs of severe untreated dental decay appear to be more common across all settings and current pain also appears to be slightly higher than in the general adult population
- Older adults are less likely to rate their oral health as good, and appear to have poorer oral health related quality of life than the general adult population
- Care home managers experience much more difficulty in accessing dental care for their residents compared to household resident older adults
- For older adults living in care homes, dental services are patchy and often no regular or emergency dental care arrangements exist.

3.2.4. Mildly Dependent Older People (2015/16)

An oral health survey of mildly dependent older people was carried out in 2015/16. This was the first oral health survey of this population group and therefore there is no directly comparable data to use which could help to show trends. The survey found⁶⁹:

- Poorer oral health tended to be found among participants who were older and those who reported an increased length of time since the last dental visit, being restricted in their ability to attend a dental practice or being in receipt of various services in their home.

- Those with a reduced cognitive recall and those with a lower level of education also tended to have worse oral health.
- Some measures of oral health were found to be worse in the youngest age group. It is hypothesised that this is related to the circumstances surrounding admission to supported housing which may have changed over time.
- 59.9% of those surveyed in Nottingham City had not seen a dentist within the last two years; higher than the England average (34%).
- Of those surveyed in Nottingham City, 61.9% has visible plaque, lower than the England average (69.9%). Similarly, the proportion of those surveyed with visible calculus was lower than the England average (42.9% and 61.3% respectively).

3.2.5. Homeless population

Homeless people are a diverse group comprising of rough sleepers but also people living in temporary accommodation. Most research has focused on the needs of single men especially rough sleepers. There is limited information regarding health problems relating to other groups such as families with children and many of the studies conducted have been calculated from a convenience sample and so may not be representative.

The limited scientific literature reveals that the oral health of homeless people is often poor, with a high level of dental need. Studies consistently reported high clinical need in terms of tooth decay, dental pain and periodontal diseases but low perceived need for oral health care⁷⁰⁻⁷³. Commonly reported oral health impacts include toothache, discomfort, ability to relax and feeling ashamed regarding the appearance of their teeth⁷⁴.

Within the low socioeconomic group of homeless men, there are also high levels of cancers of the oral cavity⁷³. With regard to access to dental care, international studies have found that homeless people often do not access dental services routinely due to fear, cost, and difficulty in maintaining appointments⁷⁵.

In addition, links between homelessness amongst adolescents and substance misuse demonstrate how these individuals are exposed to multiple risk factors, which have a negative impact on oral and general health⁷⁶.

The oral health of homeless people in Nottingham is not captured at a local level. However, future data collected alongside the Adults in Practice survey may provide oral health intelligence from populations of interest that can be compared with the Local and National Adults in Practice data.

3.2.6. Oral cancer

Oral cancer refers to cancers of the tongue, lips, inside lining of the mouth and cheeks and the oropharynx. Risk factors for oral cancer include tobacco use (smoking, paan, betel quid, gutka and chewing tobacco), alcohol, diet and the human papillomavirus (HPV). There were approximately 11,400 new cases of oral cancer in the UK in 2014 with half of the oral cancer cases being diagnosed in people aged 65 and over. However, in recent years, incidence and mortality in young and middle-aged adults have been rising. It is the 4th most common cancer in men and the 12th most common cancer in women⁵. Oral cancer incidence rates have increased by 23% over the last decade and are projected to rise by 33% between 2014 and 2035, to 20 cases per 100,000 people by 2035²⁵. Over the last decade, oral cancer mortality rates have increased by around 21% in the UK, with increase being similar in both males and females. Almost half (45%) of oral cancer deaths in the UK are in people aged 70 and over; mortality rates are higher in people aged 90+. Oral cancer mortality rates are projected to rise by 37% between 2014 and 2035⁷⁷. Survival rates increase dramatically if the disease is diagnosed in its early stages, but low awareness and the painless nature of early oral cancer means people generally only seek treatment when the cancer is more advanced and difficult to treat.

The incidence rate of lip, oral cavity and pharynx cancer between 2014 and 2016 in all persons and ages across Nottingham City (20.8 cases per 100,000) is higher than the England average (14.7 cases per 100,000). Despite some variation, this has been consistently higher when compared to England (Figure 11). The mortality rate from lip, oral cavity and pharynx cancer in 2015-17 is also higher in Nottingham City (8.1 deaths per 100,000) than for England (4.6 deaths per 100,000).

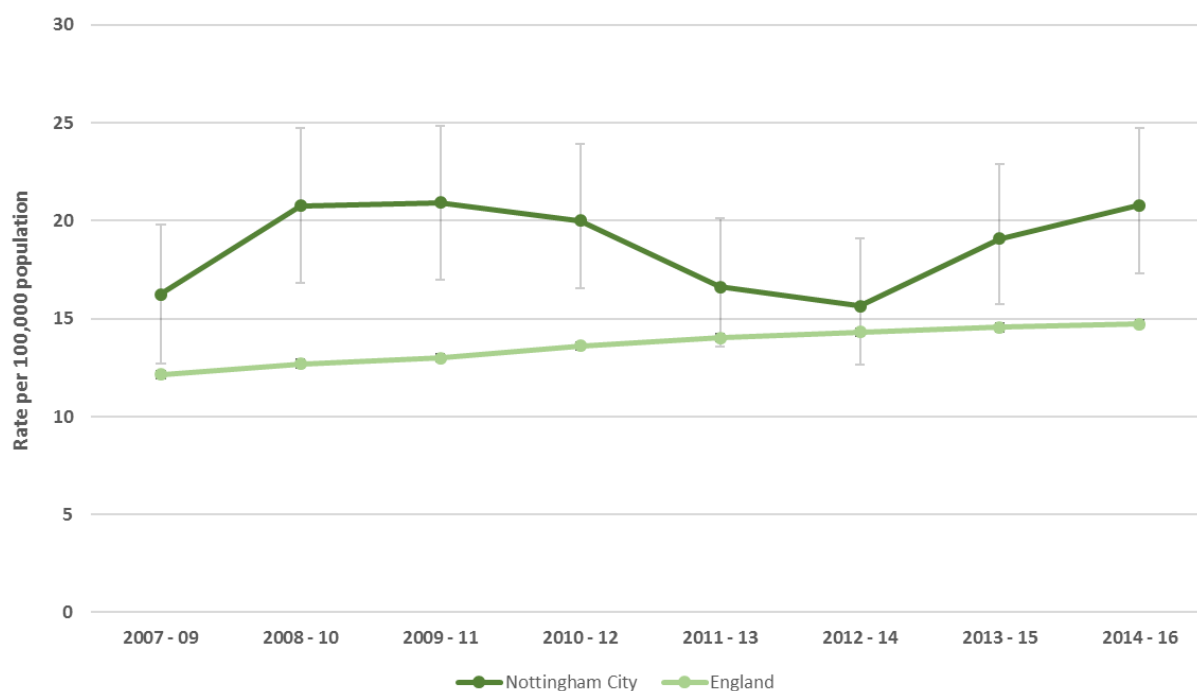


Figure 11: Incidence and mortality rate of lip, oral cavity and pharynx cancer

4. Access to services

4.1. Dental Care

NHS England has statutory responsibilities to commission NHS dental services that meet the needs of the local population and address health inequalities. Access to NHS dentistry is commissioned by NHS England for anyone who seeks it, regardless of where they live. Therefore, patients may choose to access NHS dental services in any locality of their choice. Those in employment may choose to access a NHS dentist close to where they work rather than where they live.

NHS England's over-arching aims for primary dental service provision are:

- to improve oral health and to reduce inequalities in health and wellbeing
- to improve access to NHS dental services and to improve the experience of all service users
- to develop excellent integrated and more localised services
- to ensure that key evidence based, preventive, consistent messages and interventions are communicated and delivered by all
- to ensure access to unscheduled and elective dental care is available to all
- to provide evidence informed care according to identified need

- to promote choice by service users, by ongoing consultation and engagement

The NHS General Dental Services should be designed to fit closely with the needs of all sectors of the population whilst maximising the opportunity for those with the greatest need to receive appropriate and timely dental care.

4.1.1. Current Dental Provision

In recent years access to NHS dental services has occasionally been an issue, with some anecdotal reports suggesting that it is difficult to obtain an appointment with an NHS dentist. There have been changes in the way dental services have been organised and paid for in England with the introduction of a new dental contract in England in 2006. Prior to the new contract a dental practice could open and apply to provide NHS dental services in locations of their choice. All dentists providing NHS dental services at the point of transfer to the new contract were given a contract which can exist in perpetuity, and limits NHS England's ability to redistribute service provision to areas with higher needs. There was however considerable investment by the former Nottingham PCT in NHS dental services in response to centrally determined dental access targets. The current distribution of dental practices is therefore a legacy of these events.

In Nottingham there are:

- 38 NHS general dental practices, of which 3 are child only contracts.
- A local dental access survey demonstrated that 27 (71%) of these practices were accepting new patients (May 2017).

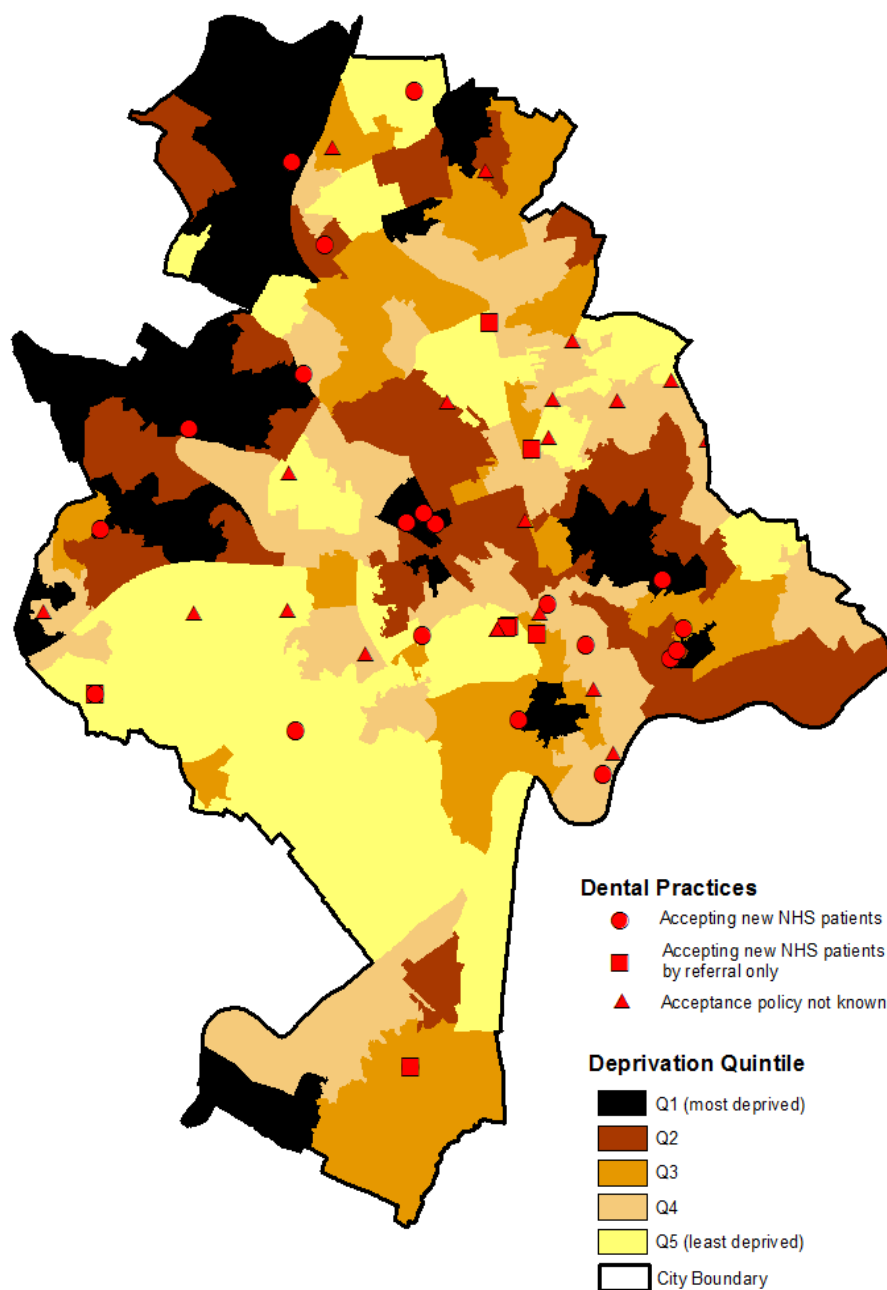
The service finder on NHS choices enables individuals to find local NHS services, including dentists. Practices are able to update their NHS choices page to provide the public with information on whether they are accepting new adult/child patients, wheelchair access, contact details, etc.

Map 3 shows the location of dental practices mapped against deprivation. The map shows that NHS dental practices are not necessarily located in the areas with highest levels of deprivation where there is liable to be the greatest unmet need, however there is reasonable geographic distribution of practices.

Almost all residents in Nottingham can access a NHS dental practice within walking distance (1km), apart from gaps noted in Clifton North, Clifton South, Dunkirk and Lenton, east of Dales, Bulwell, north of Bilborough and parts of Wollaton.

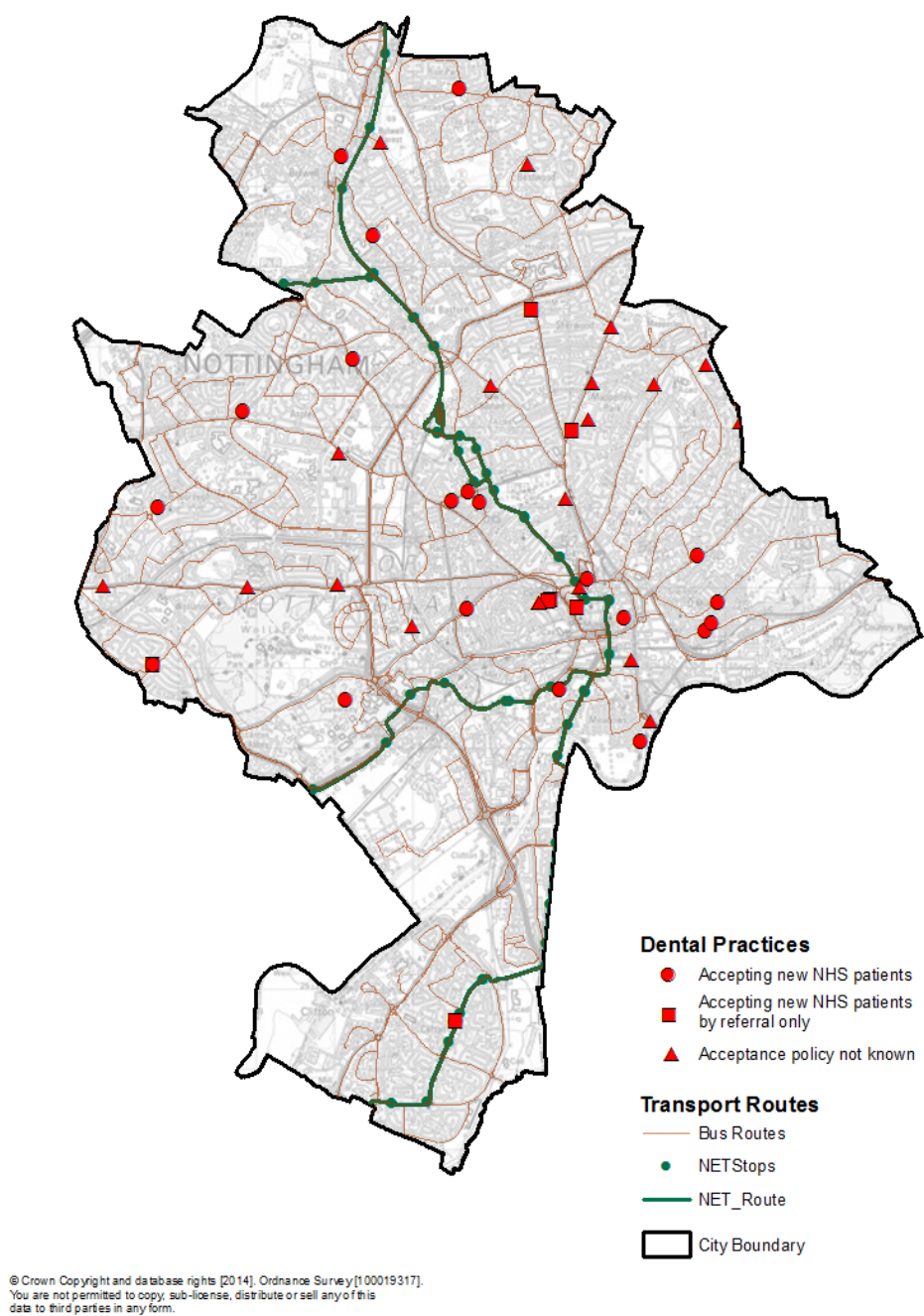
Map 4 shows that all of the dental practices are accessible by transport links. Practices in the city centre are accessible by tram and bus links; however, the majority of practices are accessible by bus with very few being accessible by tram.

Map 5 shows that dental practices are not necessarily located in areas with high densities of children. Many of the practices are located in the city centre where few children reside. There is a lack of practices in areas with high densities of children such as Bulwell and Aspley in the North West of the city.

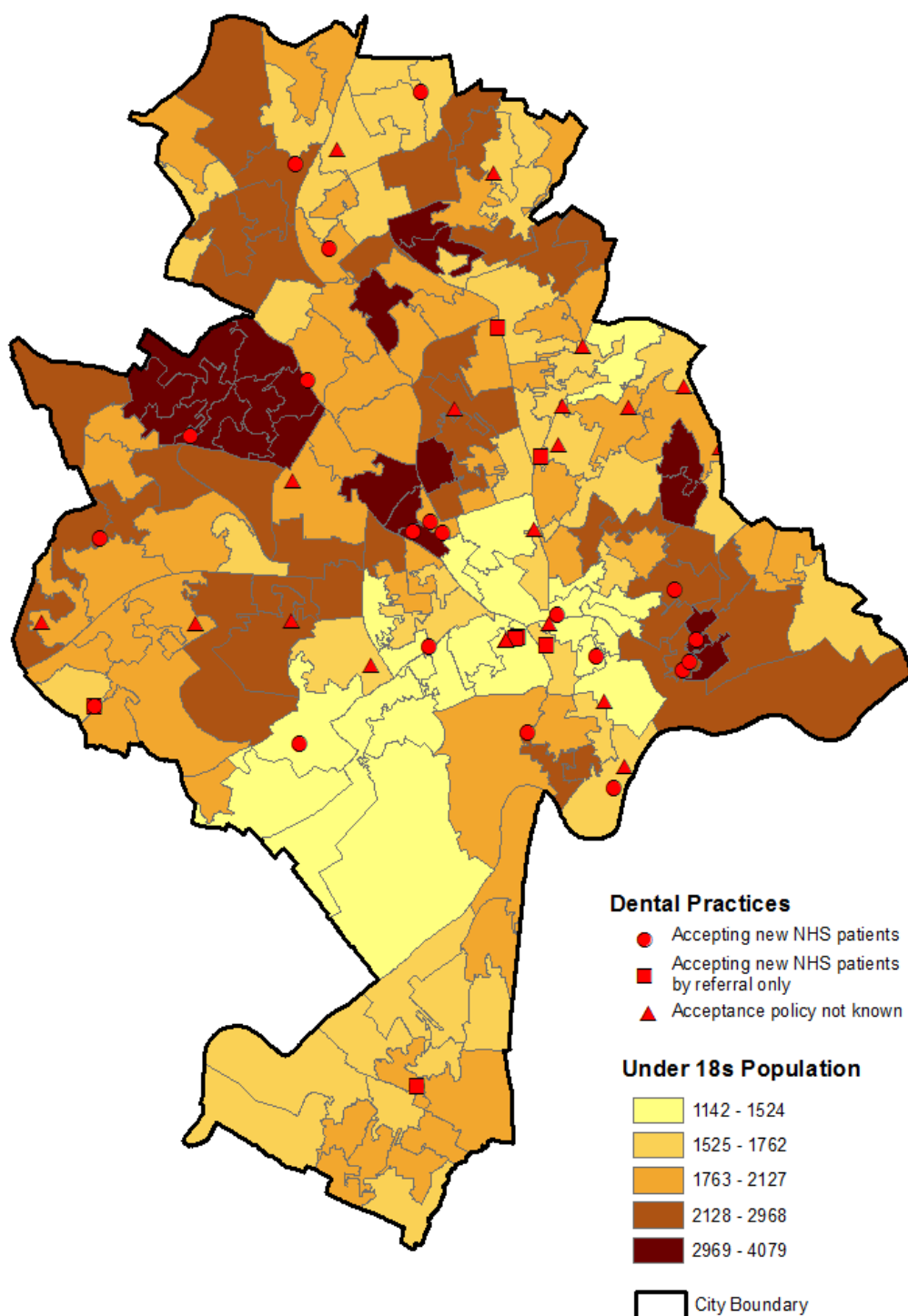


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Map 3: Location of Dental Practices by Wards and Against Deprivation in Nottingham



Map 4: Location of Dental Practices in Nottingham against Transport Routes



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Map 5: Location of Dental Practices in Nottingham against the child population

4.1.2. Dental access

Under the current dental contractual arrangements (introduced in April 2006), patients do not have to be registered with a NHS dentist to receive NHS dental care. The closest equivalent measure to 'registration' is the number for patients receiving NHS dental services ('patients seen') over a 12-month period for children and 24-month period for adults, as a proportion of the resident population.

NICE guidance recommends that the shortest interval between oral health reviews should be 3 months for any patient and that in children the longest interval between reviews should be 12 months and 24 months in adults⁷⁸.

These 'access rates' provides an indication of the number of unique patients that are considered NHS patients and can be affected and influenced by many features including the amount of dental provision in an area, the oral health needs of population, the deprivation or indeed prosperity of the resident population and so on. A low access rate therefore may not solely be due to a lack of provision; elements such as patient choice for example opting for private treatment can impact on the rate.

Service usage information with regards to NHS dental services is compiled by the NHS Business Services Authority and reported to PHE. No information is available on attendance at private dental practices, as the attendance information is based on claims made by dentists for NHS payments.

The proportion of children (0-17y) Nottingham City seen by a NHS dentist in the 12 months before end June 2018 was 62.7%. Access rates by age are shown in Figure 12. The lowest access rates are seen in early years (0-5 years) with a decline at 15-17 years when children gain greater autonomy.

Regular visits to the dentist are an important part of prevention, as this is where problems can be identified and treated early, avoiding more complex and costly treatment later, and also offers opportunity for advice on maintaining good oral hygiene. In recognition of this, the "Dental Check by One" campaign⁷⁹ was recently launched to increase the number of children age 0-2 who access dental care, as part of promoting preventative dentist visits.

All children aged under 18, or under 19 if in full time education, are exempt from NHS charges, as are all pregnant or nursing mothers.

Attendance by adults is generally lower than for under 19s. In Nottingham, the percentage of adults seen by a dentist in the previous 24 months was 57.4%. This is the third highest proportion compared to statistical neighbours (Figure 13).

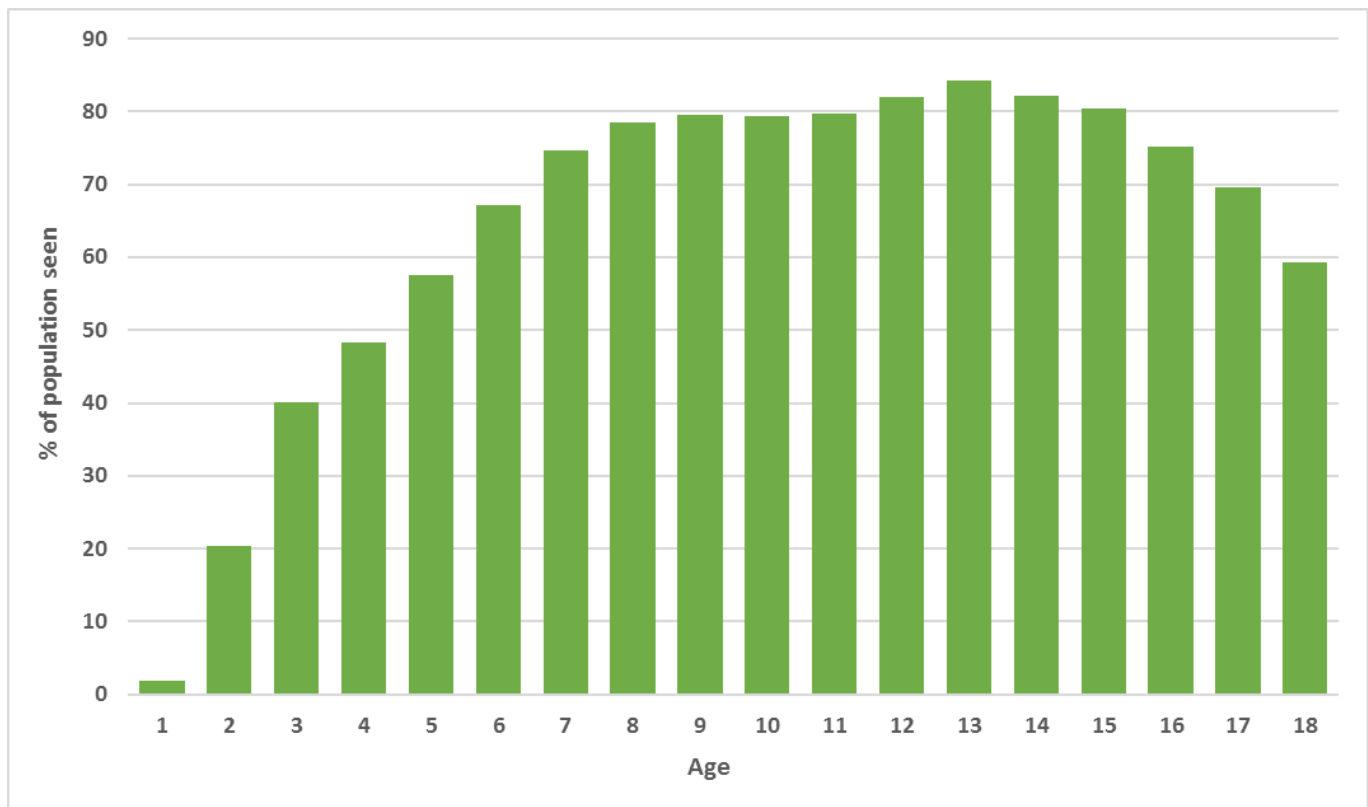


Figure 12: Proportion of Nottingham City children seen by a dentist in the previous 12 months; by age (Period end June 2018)

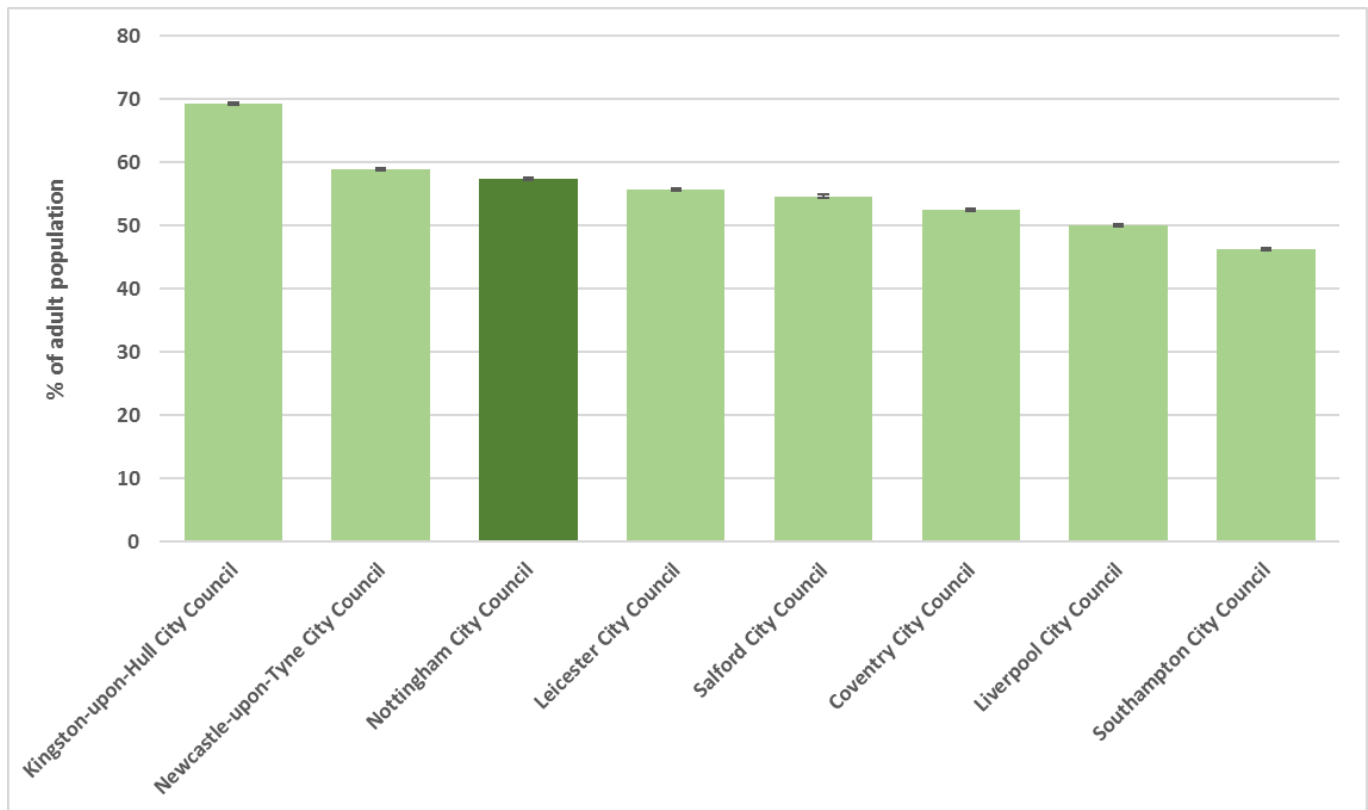


Figure 13: Proportion of Nottingham City adults seen by a dentist in the previous 24 months compared with statistical neighbours

4.1.3. NHS 111

Since April 2013, all calls for unplanned dental care are triaged through NHS 111. In 2017/18, there were 647 non-urgent calls related to dental health. Of these, 76% were advised to contact a dental service within 24 hours with the remainder advised to contact a dental service within 5-days. In addition, there were 392 urgent calls related to dental health. Of these 5% are advised to seek dental services within 2 hours, 22% within 6 hours and 73% within 6 hours. The majority of calls urgent and non-urgent calls were related to toothache without dental injury.

4.1.4. Urgent care

The Department of Health classification of a dental emergency is patients who require emergency care are those requiring immediate attention in order to minimise the risk of serious medical complications or prevent long-term dental complications.

Urgent care is a prompt course of treatment provided because that person's oral health is likely to deteriorate significantly, or the person is in severe pain. However, it only includes treatment necessary to prevent significant deterioration or to address severe pain. Most likely, it considers those requiring attention for:

- severe dental and facial pain not controlled by over-the-counter preparations; or
- dental and soft tissue acute infection

NHS England has highlighted the need for dental emergencies to be clearly classified.

A PHE review⁸⁰ described the profile of patient attending urgent dental services reported in the literature:

Age: Patients aged 24 to 59 years used the service most frequently compared to the proportion of 24 to 59 year olds in the population.

Social deprivation: People living in the most deprived areas or from low-socioeconomic groups, experience the poorest oral health and thus have increased demands for urgent dental care.

Employment: Urgent dental services were found to make access to dental treatment easier for manual workers and those with irregular shift patterns; however, evidence suggests commuters may be the primary users of services.

Dental attendance patterns: Studies in the UK have shown the main reason for choosing this service to be the inability to access another emergency dental service and service users felt the emergency dental service was easier to get into than their own dentist. This data supports the need to consider the availability of scheduled general dental services and support frequent users to seek routine care.

Studies of predictors of care seeking behaviours of individuals using unscheduled care identified symptoms, dental anxiety, knowledge of services, changes in circumstances, costs, having a disability and living in rural areas as key predictors. As such, PHE identified several other patient groups in the literature having specific implications for urgent dental services:

- Homeless, people with disabilities,
- People living in care homes,
- People with pre-existing conditions,
- People with dental anxiety
- Prisoners
- Refugees
- Asylum seekers

4.1.5. Domiciliary care

Domiciliary dental services are concerned with providing and enabling the improvement of oral health of individuals and groups in society who have one or a combination of physical, sensory, intellectual, mental or medical factors that limits their ability to access oral health care services appropriate to their needs.

The service provides a domiciliary dental service to care homes and patients confined to their own homes. It includes full clinical examination, an oral health risk assessment and appropriate treatment, including preventative care for patients with long term and/or progressive medical conditions; mental illness or dementia, causing disorientation and confusion in unfamiliar environments; or increasing frailty who are unable to travel to a dental surgery and who could not otherwise access dental care. In addition, the service provides care to patients who require urgent dental treatment whilst in hospitals.

4.1.6. Antibiotic prescribing

Antimicrobial resistance is the ability of microorganisms such as bacteria, viruses, and some parasites, to stop antimicrobials (antibiotics, antivirals and anti-malarials) from working against them. As a result, standard treatments become ineffective, infections persist and may spread to others. Antibiotic resistance is one of the biggest threats to public health and can affect anyone, of any age, in any country. It occurs naturally, but misuse of antibiotics in humans and animals is accelerating the process and a growing number of infections (such as pneumonia) are becoming harder to treat as the antibiotics used to treat them become less effective. Antibiotic resistance leads to longer hospital stays, higher costs to the NHS and increased mortality.

Antibiotics do not cure toothache and there is likely scope for dentists within Nottingham City to improve some of their prescribing practice for acute dental conditions. Between April 2017 and March 2018, 96,714 antimicrobial items were prescribed across Derbyshire and Nottinghamshire. The top antimicrobial items prescribed by local teams are shown in Table 4.

Table 4: Top antimicrobial items prescribed by local team as a percentage of all antimicrobial items

	Amoxicillin	Metronidazole	Erythromycin	Clindamycin	Other
Local Team					
Durham, Darlington and Tees	69.7	25.4	3.4	0.3	1.2
Bristol, North Somerset, Somerset and South Gloucestershire	68.7	26.3	2.9	0.5	1.6
East Anglia	68.5	25.1	4.1	0.7	1.7
Leicestershire and Lincolnshire	68.1	25.1	4.3	0.6	2.0
Cumbria, Northumberland, Tyne and Wear	67.8	28.5	2.3	0.2	1.2
Devon, Cornwall and Isles of Scilly	67.4	25.6	3.3	0.7	2.9
Surrey and Sussex	67.1	26.0	4.1	0.8	2.0
North Yorkshire and Humber	67.0	27.2	3.5	0.8	1.5
Derbyshire and Nottinghamshire	66.5	28.0	3.1	0.4	2.0
Thames Valley	66.5	27.1	3.8	0.6	2.0
West Yorkshire	66.4	28.4	3.5	0.2	1.4
South Yorkshire and Bassetlaw	66.1	29.0	3.2	0.2	1.4
Greater Manchester	66.0	29.5	3.2	0.2	1.2
Wessex	65.7	27.5	4.0	0.9	1.9
Bath, Gloucestershire, Swindon and Wiltshire	65.5	29.2	2.9	0.6	1.8
Hertfordshire and the South Midlands	65.4	28.9	3.8	0.4	1.4
Shropshire and Staffordshire	65.4	28.5	3.7	0.3	2.1
Arden, Herefordshire and Worcestershire	65.4	29.5	3.4	0.3	1.4
Birmingham and The Black Country	65.3	30.4	3.1	0.2	1.0
Kent and Medway	65.3	27.7	4.1	1.2	1.7
South London	64.7	29.7	4.0	0.4	1.2
Cheshire, Warrington and Wirral	64.7	30.0	2.7	0.4	2.1
North West London	64.5	29.6	3.9	0.3	1.7
North East London	64.2	30.7	3.2	0.3	1.7
Lancashire	63.7	30.7	2.3	0.5	2.7
Essex	63.6	28.0	5.0	0.8	2.6
Merseyside	62.5	33.3	2.3	0.5	1.5
Total	65.9	28.5	3.5	0.5	1.7

4.2. Preventative dental care

4.2.1. Fluoride varnish

National guidance⁹ recommends that all children aged 3 years and over should have fluoride varnish applied every six months, and that this frequency can be increased for children (including those <3years) who are considered to be at high risk of dental decay. Fluoride varnish can only be prescribed by a dentist (individual patient) or a Patient Group Directive (community based programmes) and can only be applied by GDC registered practitioners (dentists, therapists, hygienists and dental nurses with additional training).

Figure 14 shows that the proportion of children receiving fluoride varnish in Nottingham City has been consistently higher than the proportion in receipt of this form of preventive care across the Midlands and England.

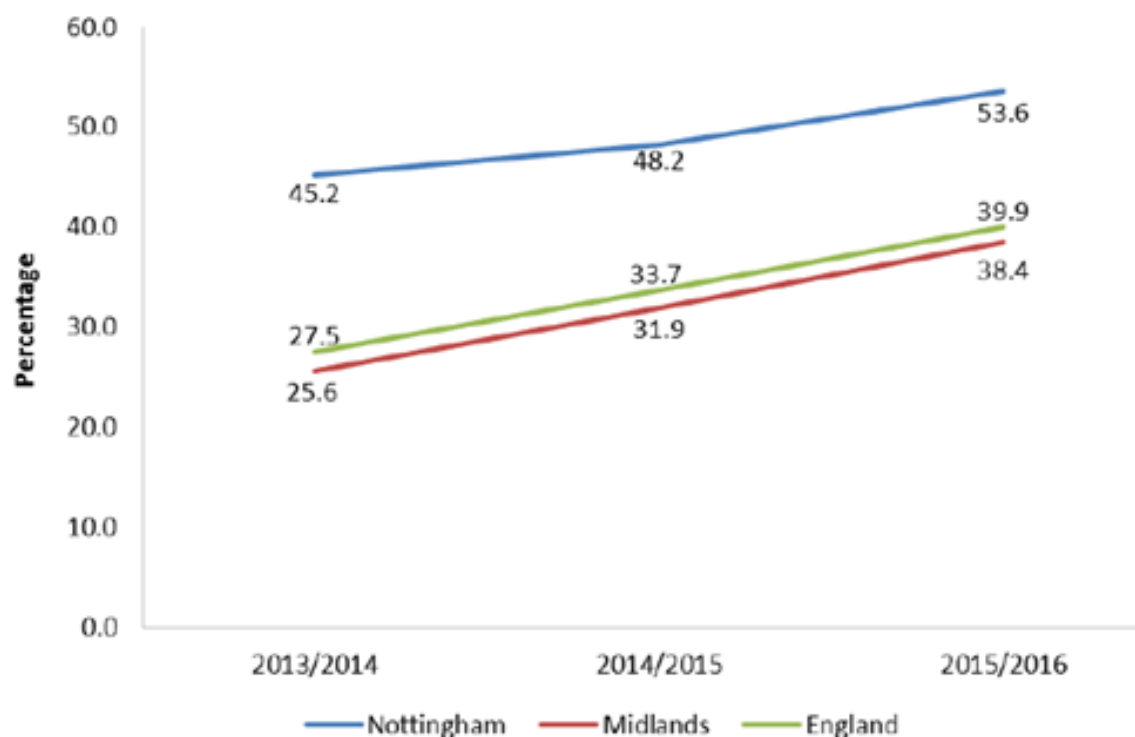


Figure 14: Rate of Fluoride Varnish application in Children (3-16 years) in Nottingham, compared to the Midlands and England (2013–16). Source: NHS Business Service Authority (2016)

4.2.2. Fissure Sealants

Fissure sealants are plastic coatings that are painted on to the grooves of the molar (back) teeth. The sealant forms a protective layer that keeps food and bacteria from getting stuck in the tiny grooves in the teeth and causing decay. To be most effective fissure sealants should be applied to the permanent molars as early after eruption as possible. Fissure sealants can only be applied by dentists, therapists or hygienists and are recommended for those at high risk of developing caries⁹. The rate of fissure sealant applications has increased steeply between 2014/15 and 2015/16 for Nottingham City and is now higher than that for both the Midlands and England.

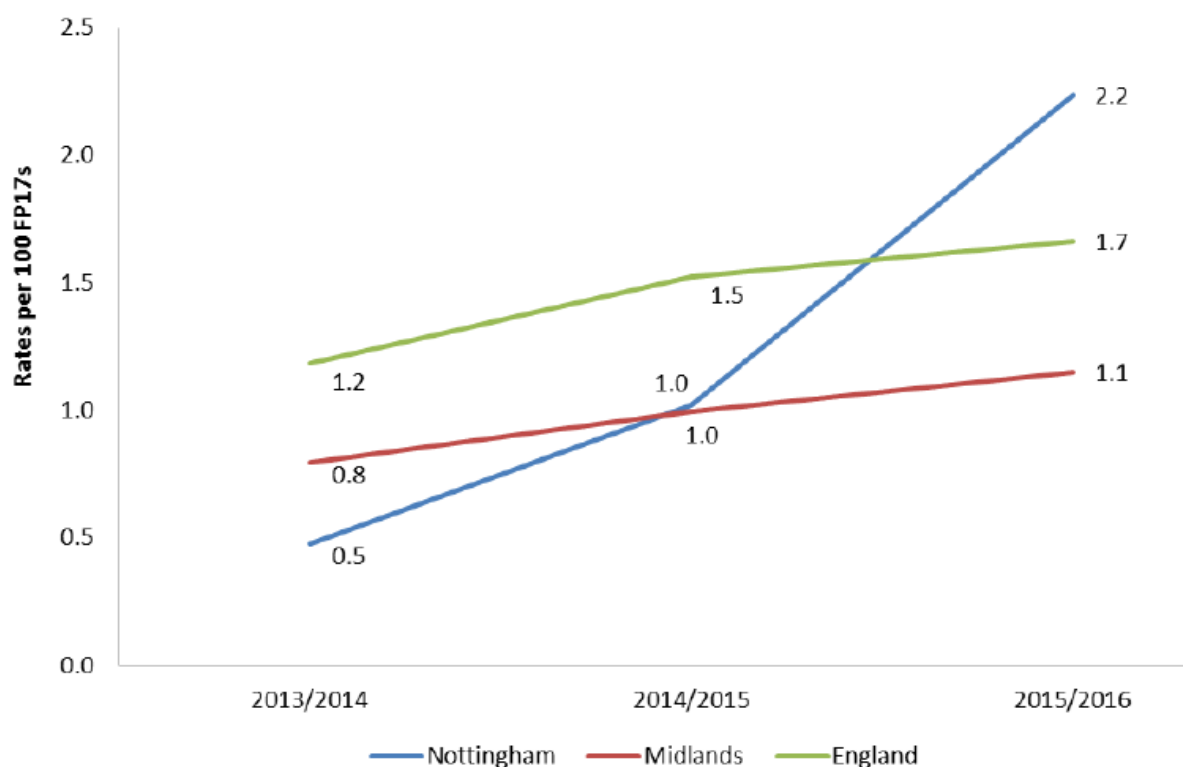


Figure 15: Rates of Fissure Sealants for children (3-16 years) in Nottingham, compared to the Midlands and England (2013–16). Source: NHS Business Service Authority

4.3. Early years and Oral Health Promotion Service

The provision of the oral health promotion service (supervised tooth brushing in schools, local oral health campaigns, toothbrushes/toothpastes for health visitors) ended on 31st March 2018.

Schools and health visiting teams were kept well informed of the decision and received links to resources to support school lessons and information on how to find out more about the dental practices available near them. Many schools continued supervised tooth brushing until the end of the 2017/18 academic year and some continue to do so.

In addition to providing supervised tooth brushing, the service provided training to health and educational professionals and supported them to impart standardised and consistent oral health advice to their service users. Health visitors continue to provide brief advice on oral health to new parents and have access to e-learning produced by Public Health England.

4.3.1. Other early years organisations

4.3.1.1. Small Steps Big Changes

Small Steps Big Changes is Nottingham's 10 year "A Better Start" Big Lottery Funded Programme to improve the outcomes of 0-3 years olds. Headed up by CityCare, a third sector provider of community health services, SSBC is a new partnership between the City Council, Health partners, Voluntary Sector Organisations, Parents, Families and Communities. The programme focuses on children, parents and communities in Arboretum, Aspley, Bulwell and St Anns.

SSBC has a broad portfolio focusing on Language and Communication; Diet and Nutrition; and social and emotional development. Initiatives such as enhanced health visitor pathways, breastfeeding peer support, and cook and play session are currently available. Oral health has been included within the SSBC's Diet and Nutrition work stream for the remaining 5 years. SSBC has commissioned Nottinghamshire Healthcare Trust to offer supervised tooth brushing in four schools within its catchment. Other oral health initiatives are also being considered to improve the oral health of 0-3 year old including staff training and resources. Parent champions, who represent their communities, will play an active role in designing and delivering these health promotion activities.

4.3.1.2. Rebalancing: The Outer Estates Foundation

Rebalancing the Outer Estates Foundation is a small charity based in Bulwell, Nottingham. It works in partnership with a range of organisations to enable and support positive change and build strong and healthy communities.

Rebalancing has partnered with the Teeth Team, a Hull based charity, to offer an oral health initiative in Nottingham North's primary schools. This programme teaches primary school age children about oral health care and links with local dental practices. This support is offered at a cost to the primary schools.

4.3.2. Related programmes of work.

4.3.2.1. Diet and Nutrition

Nottingham City Council commissions a range of services that support families and children to eat healthily and maintain a healthy weight (Appendix 1). New 'healthy weight' pathways are being created within the integrated 0-19 service. A network analysis is exploring who in Nottingham City works on helping children 'eat better and move more for good health' has been conducted with the intention of creating a whole system approach.

Nottingham City Council commission a breastfeeding support service, within the 0-19 years' service specification. This service works alongside both the maternity and health visiting teams to target all mothers under the age of 25 to support initiation and continuation of breastfeeding.

Services for adults and those transitioning into adult services have been impacted by the unprecedented financial challenge. However, referral for 'at risk' groups to a commercial weight management provider is currently available and a new, universal digital weight management offer is to be rolled out in 2019.

4.3.2.2. Smoking

A new targeted smoking cessation service, StubIt, has been commissioned by Nottingham City Council. Currently delivered from Upper Parliament Street, the service will support smokers living with long term conditions, smokers with mental health problems, pregnant smokers and their partners and smokers with substance misuse problems. Smokers who fall into any of these categories will receive a referral to the service from the appropriate professional and will be offered a 12 week programme of intensive behavioural support combined with pharmacotherapy.

In addition, Nottingham City CCG continues to fund smoking cessation advisors within Nottingham University Hospitals to deliver smoking cessation support to smokers that have been admitted to hospital.

4.3.2.3. Substance misuse and Alcohol services

Nottingham City GPs have been incentivised to use Identification and brief advice (IBA) with patients aged 16 and over who are likely to be misusing alcohol and for offering brief advice to patients found to be drinking at increasing-risk or higher-risk levels.

Current community drug treatment in Nottingham is delivered by a consortium of providers working from one city centre base. This service delivers interventions for all adult clients requiring unstructured and structured (pharmacological and/or psychosocial) treatment regardless of the drug of choice or complexity. It offers a single point of access, assertive and proactive engagement of drug users into treatment, brief interventions, evidence based structured treatment and harm reduction interventions including blood borne virus testing and vaccination. The service also provides outreach into the night time economy and advice and training for professionals.

There are also structured interventions delivered in primary care settings by Shared Care (Specialist GPs working with specialist drug treatment workers) to those largely stable drug users. A specialist needle exchange and harm reduction service is also delivered in the City.

4.3.2.4. Mental Health services

Children and Adolescent Mental Health service (CAMHS) prevention and early intervention work links schools and universal services to offer support and training to staff. The City's CAMHS 'Single Point of Access' model is quite unique nationally ensuring referrals are processed quickly and effectively and children and young people can be navigated to the right support for them depending on their presentation and needs.

Nottingham CCG commissions Talking Therapies for anyone over the age of 18 years, including those over 65 years of age, who is registered with a GP in Nottingham City and who is suffering from common mental health disorders. Nottingham City CCG commissions this service on an 'Any qualified provider' basis. There are currently 4 IAPT services that cover Nottingham City.

5. Evidence of what works

Delivering better oral health: an evidence-based toolkit for prevention⁹ from PHE provides dental teams with evidence based guidance for delivery of preventive care and methods of helping patients improve their self-care. This builds on the guidance of the earlier editions which has initiated a reorientation of dental care towards prevention of disease rather than treatment of existing disease, a principle that also underpins the current Dental Contract Reform Programme.

Commissioning better oral health for children and young people⁸¹ and oral health improvement for local authorities and partners¹⁴ both provide evidence informed guidance to local authorities to support their commissioning duties regarding the improvement of and maintenance of the oral health of children. The guidance advocates a population approach with advice and actions for all, with additional interventions aimed at those at higher risk of developing disease.

5.1. Underlying causes of oral diseases

Oral health shares a number of common risk factors with other long term conditions. It is also not unique in experiencing a social gradient which highlights the underlying influence of psychosocial, economic, environmental and political determinants.

In understanding oral health as a consequence of wider social and economic processes, a broader picture emerges. The determinants of oral health are multi-factorial, from the environmental level of health and social care policies, infrastructure and employment, to the more local level of community and social norms down to family dynamics and individual level attitudes and beliefs⁸².

Inequalities in dental health are consistent across various measures of deprivation and socio-economic status in childhood has been found to be a key determinant of lifelong oral health trajectories⁸³.

This breadth of these factors and their influence on intermediate and proximal factors such as individual behaviour, can be summarised by models like the one below.

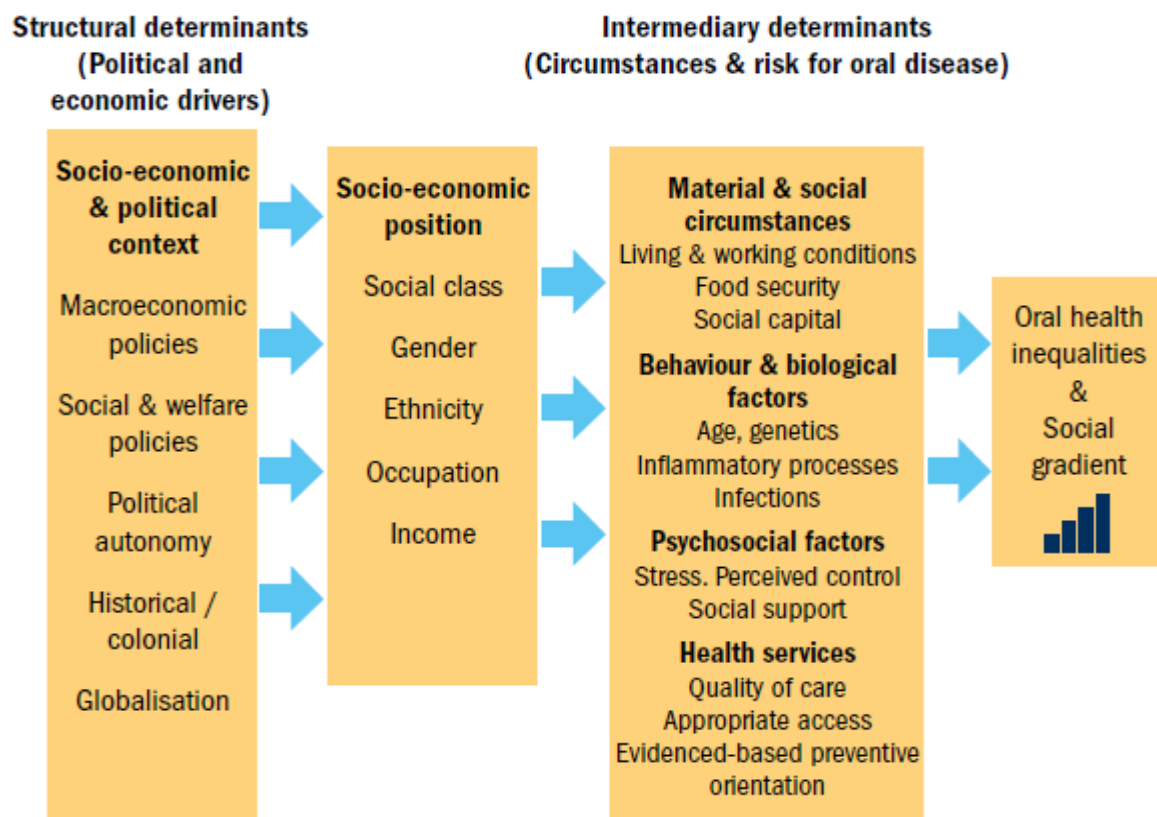


Figure 17: A social determinants model of oral health inequalities⁸⁴

5.2. Consequences of poor oral health

A healthy mouth enables not only nutrition of the physical body, but also enhances social interaction and promotes self-esteem and feelings of well-being. Poor oral health impacts on not just the individual's health but also on their wellbeing and that of their family. There are also wider social and economic consequences.

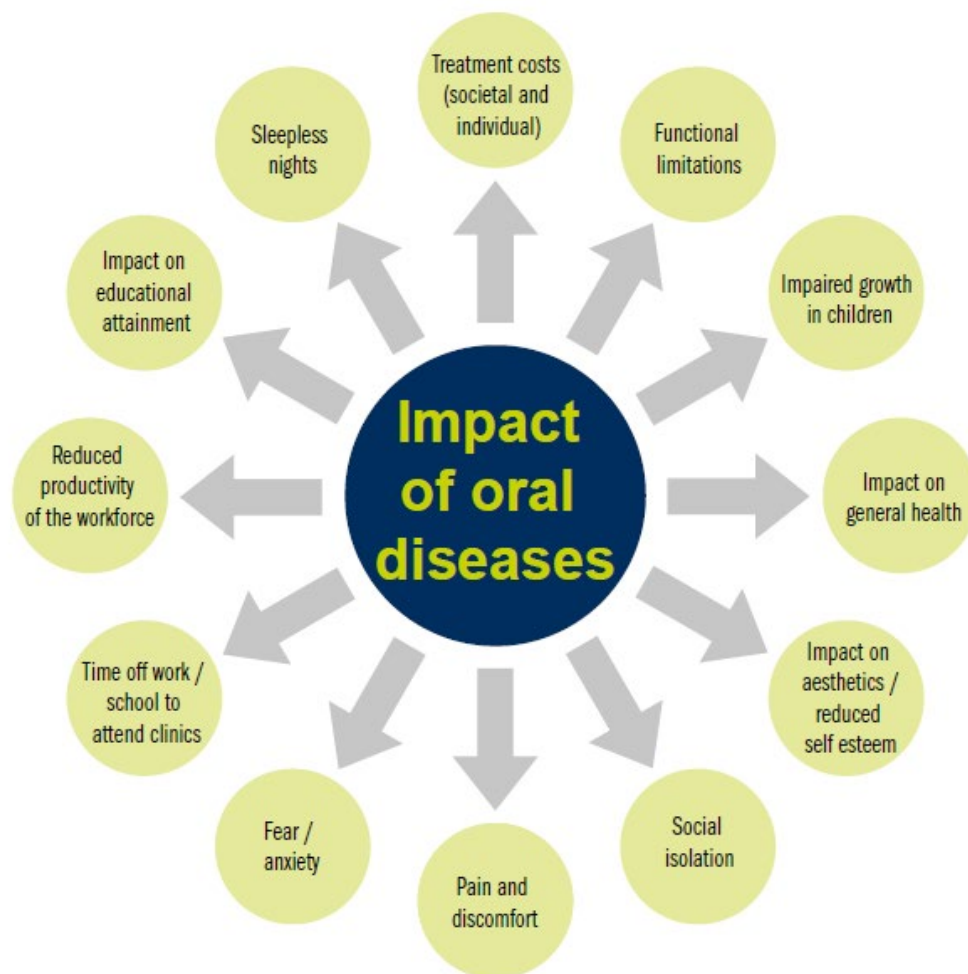


Figure 18: Summary of impacts of oral diseases⁸⁴

Oral health diseases have economic consequences for the public sector and for wider society as well as for individuals. Advances in dental treatment make it possible to address many oral health problems but can be expensive. The most recent NHS annual accounting report gives the total costs of NHS dental treatment for all ages at £2.944 billion in 2017/18 Income of £807 million towards these costs was received in the form of dental charges⁸⁵. The social costs of oral health are harder to quantify but it is estimated that there is a significant cost due to lost productivity.

5.3. Tackling poor oral health

A range of options to promote oral health across the spectrum of action from upstream to downstream approaches. Healthy public policies, legislation, regulation and fiscal measures can all be utilized to promote oral health either at local, national or indeed international levels⁸² (Figure 19).

Clinical intervention is shown to be at the lowest level, focusing on individuals, with community level interventions somewhere in the middle and large-scale regional interventions such as water fluoridation and 'Health in all policies' at the top, having the widest reach and an environmental level impact.

Public Health England considered the strength of the evidence, impact on reducing inequalities, cost/resource implications and implementation issues for a number of oral health interventions, in 2014 as set out in Figure 19. (Appendix 1 –Table 3.3. Commissioning better oral health for children and young people)

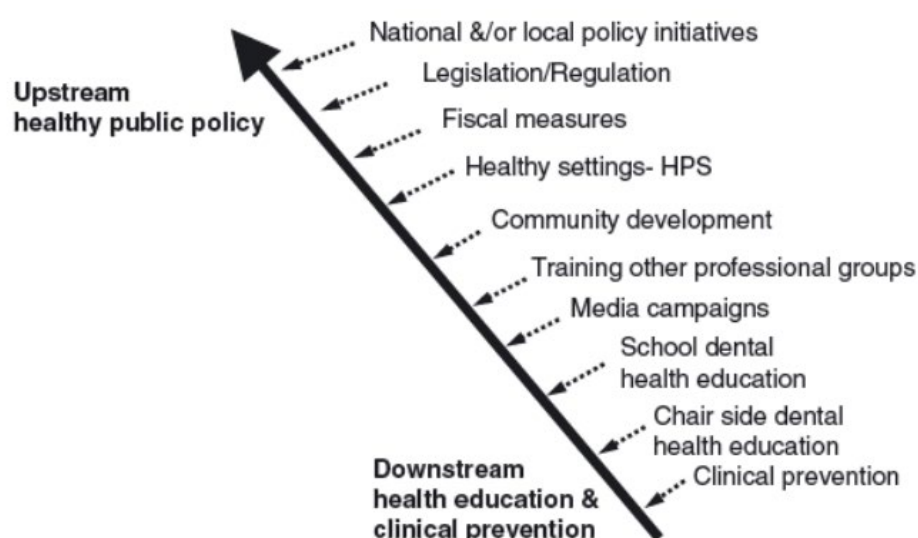


Figure 19: Upstream/downstream approaches to oral health improvement⁸²

As with many public health issues, a conceptual shift is needed away from 'downstream' action focused on individual behaviour to addressing 'upstream' factors that underpin the social determinants of population oral health.

5.3.1. Cost effectiveness

A review of the cost effectiveness of preventative interventions for 0-5-year olds was undertaken in 2016 by York Health Economics Consortium for PHE⁸⁶. For targeted supervised tooth brushing programmes, return on investment (ROI) for every £1 spent was calculated at £3.06 after 5 years and £3.66 after 10 years. For targeted provision of tooth brushes and tooth paste by post and by health visitors, ROI was calculated at £4.89 after 5 years and £7.34 after 10 years. For a universal water fluoridation scheme, the estimated return for £1 investment was £12.71 after five years and £21.98 after ten years.

5.3.2. Health in All Policies (HiAP)

In the context of local government, 'Health in All Policies' (HiAP) focuses on maximising the potential of the breadth of influence local government has over the social determinants of ill health. It describes a collaborative approach which emphasises the connections and interactions between public health and policies/decisions from other local government sectors.

HiAP engages a range of partners to work together to improve health and reduce inequalities and, at the same time, address the social determinants of health. In doing so it advances other goals, such as educational attainment, improved housing and green spaces, environmental sustainability, promoting job creation and economic stability.

Oral diseases, dental caries and periodontitis (gum disease) are largely preventable with significant and consistent inequalities; improving oral health requires a multi-agency approach. Nottingham City also lends itself to a HiAP approach given the range of social challenges (e.g. childhood poverty, housing, school readiness, educational attainment, fast food outlets, employment⁸⁷) impacting on the health of the population.

5.3.2.1. What might a HiAP approach to oral health look like?

While oral health may not be the primary focus of a HiAP approach, it benefits from the breadth of action that can influence the risk factors it shares with other long-term conditions. In addition, there are specific policies which may more directly influence oral health, including⁵⁵:

- Guidelines for the procurement of food provision (including vending machines) in council buildings, schools, children's centres, leisure centres and by commissioned services, offers the opportunity to create a consistent and positive food environment. A review of evidence found,

where evaluated, healthy food procurement programs were nearly always effective at increasing availability of healthier food and decreasing that of less healthy food as well as potentially improving health outcomes^{88,89}.

- Where existing community groups exist providing training and support to enable peer-led oral health promotion. While peer support models are evidenced for a number of areas (e.g. breastfeeding, infant feeding, smoking cessation), there remains limited evidence for oral health peer support models.
- Council policies on the built environment (e.g. planning, open spaces, community protection) and local marketing space have the potential to influence the health of the local population, including oral health.
- Advocacy for national policies is also a key part of a HiAP approach. This may include tighter controls on advertising to children; the promotion and labelling of sugary food and drink; and fiscal measures such as the taxation of tobacco and minimum unit pricing for alcohol.

5.3.2.2. Health in All Policies in Nottingham City

Nottingham City has begun a programme of work related to HiAP. The initial focus of this work has been on workplace health and wellbeing and the upskilling of health and social care staff in brief health and wellbeing advice.

5.3.3. Community water fluoridation

5.3.3.1. What is water fluoridation?

All water contains the mineral fluoride naturally in varying amounts. It is also present in some food. It can help to prevent tooth decay, which is why it's added to the majority of brands of toothpaste.

Water fluoridation involves adjusting the fluoride level in drinking water supplies to an amount that is optimal for dental health. The target level set for schemes in England is 1mg/l or 1 part per million (1PPM). Some water supplies in England contain around 1PPM naturally; some contain more than this level. EU legislation allows for up to 1.5PPM to be present in potable water supplies.

5.3.3.2. Whose responsibility is water fluoridation?

Following implementation of the Health and Social Care Act 2012, local authorities have the power to make proposals regarding water fluoridation schemes. Primary legislation is the Water Industry Act 1991 as amended and the process for making proposals is set out in The Water Fluoridation (Proposals and Consultation) (England) Regulations 2013.

5.3.3.3. What are the benefits of water fluoridation?

Scientific evidence reviews confirm that fluoride in water at a level of 1ppm (part per million) can safely and effectively lower the risk of dental decay and reduce its severity.

The effects of fluoride in water have been extensively studied and reviewed over the last 50 years. PHE have released two reports monitoring UK fluoridation schemes (2014 & 2018) and in 2015 a high quality review of published studies in relation to 'water fluoridation for the prevention of dental caries' was conducted by Cochrane Collaboration .

Other important evaluations have also been conducted by the Australian Government National Health and Medical Review Council (2017); the Irish Health Research Board Review (2015); the US Public Health Service Recommendation for Fluoride Concentration in Drinking Water (2015); the Royal Society of New Zealand (2014); the US Community Preventive Services Task Force (2013); the Australian National Health and Medical Research Council (2007); the US National Research Council (2006); the Medical Research Council (2002); and, the NHS Centre for Reviews and Dissemination (2000). Additionally, fluoride and fluoridation has been considered by the European Food Safety Authority (2005), and the European Commission Scientific Committee on Health and Environmental Risks (2011).

In summary, the PHE monitoring report (2018) found Fluoridation was associated with a reduction in the number of five-year olds who experience tooth decay along with a decrease in the severity of tooth decay. The greatest reductions were observed in the most deprived areas; leading to a reduction in oral health inequalities. In addition, hospital admissions for tooth decay were, on average, 59% (95% CI: 33% to 76%) lower in areas with fluoride of >0.7mg/l compared to areas with fluoride <0.1mg/l

The 2015 Cochrane review of studies on the effectiveness and safety of water fluoridation in the UK found similar, positive benefits on the rates of tooth decay in children following water fluoridation. Little research has been conducted on the benefits of fluoridated water for adults; it is suggested by Public Health England that fluoridation strengthens enamel and reduces the need for dental treatment.

Current evidence has several limitations. National monitoring is only possible at a local population/community level. This limits the ability to consider individual exposure to fluoridated water and/or the impact of exposure to other sources of fluoride. As such, while much of the data available is unable to definitively, prove a protective and/or causal relationship, it offers the best available insight into the impact of water fluoridation in the UK.

Children, particularly those in the most deprived areas, are likely to benefit most from Water Fluoridation. This benefit will likely occur on both their primary (baby) and subsequently, the development of secondary (adult) teeth. However, fluoridation should not be viewed in isolation. Targeted tooth brushing programmes have been shown to reduce inequalities in tooth decay and diet/nutrition play an important role in oral health.

5.3.3.4. Is there any evidence of harm to health due to water fluoridation?

Public Health England (PHE), on behalf of the Secretary of State for Health and Social Care, is required by legislation to monitor the effects of water fluoridation schemes on the health of people living in areas covered by these arrangements. The latest data from PHE (published March 2018) and published literature is summarised below.

i) Non-dental health impacts

The range of health conditions that have been alleged as a consequence of water fluoridation is substantial, but the scientific basis is inconclusive. There is not considered to be any reliable evidence of any adverse impact on general health from fluoride in water at a concentration of 1 ppm (part per million), whether naturally occurring or added. The latest PHE review of fluoridation schemes reports that, taken alongside existing evidence, the data does not provide convincing evidence to suggest fluoridation schemes are responsible for variations in rates of hip fracture, Down's syndrome, bladder cancer, or osteosarcoma (a cancer of the bone). There was some evidence to suggest some non-oral health benefits e.g. reduced rates of kidney stones, due to fluoridation schemes.

When assessing the risks of fluoridation it is important to consider the quality of the evidence presented. In addition to the data provided by PHE, the links between fluoridation and adverse health outcomes have not been confirmed by large-scale meta-analyses; a rigorous scientific methodology that 'pools' the results of a number of studies to improve the ability to make informed decisions. Bodies opposing fluoridation may present data from individual studies. These may not

robustly consider all the alternative causes of an association (i.e. confounders) and cannot identify cause and effect.

ii) Dental health impacts

The only known unwanted effect from water fluoridation at 1ppm (part per million) is an increase in mild / moderate dental fluorosis. Fluorosis is a cosmetic condition, not a disease. It presents as mottling of the tooth surface. Often, it is so mild that only a dental professional can detect it. Cases of fluorosis may result from young children taking fluoride supplements or swallowing fluoride toothpaste when the water they drink is already fluoridated.

Data collected by Public Health England from 19804 children aged 11 to 14 years, resident in 4 cities (two fluoridated and two non-fluoridated), showed that fluorosis found on examination to be of a level corresponding to what would typically be considered to cause at least mild aesthetic concern, was 10.3% in the 2 fluoridated cities and 2.2% in the non-fluoridated cities. However, when children and young people were asked to report their own concerns about the appearance of their teeth, no significant difference in results was observed between fluoridated and non-fluoridated cities.

This data supports the 2015 Cochrane review which reports "it should be acknowledged that moderate fluorosis may be considered an 'unwanted effect' rather than an adverse effect. In addition, mild fluorosis may not even be considered an unwanted effect".

6. Service user views

6.1. GP Patient survey

NHS England has published the Outcomes Benchmarking Support Packs at Local Authority and Clinical Commissioning Group level. Both packs present high level comparative information on the NHS, Adult Social Care and the Public Health Outcomes Framework.

The GP Patient Survey is sent to a sample of patients registered with a GP in Nottingham City. It is expected the majority of these will also receive dental treatment in Nottingham City. Patients are asked about their overall experience of primary care services, which includes dental services, and specifically asked questions about access.

In Nottingham City (January-March 2017):

- 91.2% of those who had sought a NHS dental appointment in the last 2 years were successful.
- 80% of those who attended a NHS dental appointment thought the experience was fairly or very good.
- Of those that hadn't sought a dental appointment in the last 2-years, 27% of them felt they hadn't needed to visit a dentist and 20% preferred to attend a private dental practice.

At a regional level, differences were observed in the proportion of citizens who successfully booked an NHS dental appointment, between ethnic groups. Slightly lower rates of success were seen for Asian or Asian British; Black or Black British and Other Ethnic Groups.

7. Unmet needs, service gaps and knowledge gaps

- The decision not to recommission an 'Oral Health Promotion Service' in April 2018 as part of the council's financial challenge, has led to a gap in service provision. While some schools are receiving supervised tooth brushing (funded by other organisation), there remains a need for this cost-effective service.
- Fluoride varnish rate remain higher than the regional average and show a positive trend in recent year. However, there remains a high proportion of children not receiving fluoride varnish, suggesting significant work remains.
- Access rates to dental services show a significant proportion of children and adults should be attending the dentist more frequently. Greater attendance by adults on a regular basis is likely to prevent escalation of need for more urgent services.
- Nottingham City does not benefit from fluoridation of its public water supplies (naturally or man-made). Given the high levels of deprivation within the Nottingham City boundary and higher levels of dental decay, there is potential for Nottingham City residents to benefit from a fluoridation scheme. Further understanding of the feasibility of a community water fluoridation scheme is required.

- The CQC and Long Term Plan identify a gap in the dental care of older people in care homes in England; in particular with respect staff training on urgent problems and access to urgent dental care.
- It is unclear what brief advice (e.g. smoking, alcohol, diet, social needs) is offered at the dentist chair and how consistently this is provided. A system approach to ensuring these teachable moments are not missed is key to promoting positive health improvement.

8. Recommendations

Strategic

1. A Health in All Policies approach should be used to influence the social determinants of health and subsequently improve oral health outcomes. Consideration of oral health should form part of any standard guidance on conducting Health Impact Assessments locally.

Relevant to: All public sector agencies

2. Integrate oral diseases into policies addressing non-communicable diseases and general health more broadly to secure health and wellbeing throughout the life-course.

Relevant to: All public sector agencies

3. Better understand the feasibility, cost and benefit of a community water fluoridation scheme in Nottingham City. Exploration should consider all Nottingham City residents but prioritise those with the highest levels of decay experience i.e. LAC 3, 1, 4 and 2.

Relevant to: Nottingham City Council, Public Health England and NHS England

Commissioning

4. The approach to delivery of future oral health promotion interventions must consider changes in demography and focus on reducing inequalities in our most vulnerable groups.

Relevant to: All commissioners

5. Commissioners should ensure equitable access to NHS dental services within reasonable travel time for every citizen in the City. This should include access to urgent care and out of hour's dental services.

Relevant to: All commissioners

Prevention

6. Improve the oral health care of older people living in care homes through working with care homes to promote the use of NICE and CQC guidance.

Relevant to: Adult Social Care, Local Authority, Public Health, PHE and NHS England

7. Integrate oral health promotion across adult and children's clinical pathways and health and social care services e.g. integration of oral health within early years' services, frailty pathways, avoidable injuries.

Relevant to: Integrated Care System clinical leads, commissioners and providers

8. Systematic, pro-active follow up of children who experience hospital admission for the reason of tooth decay.⁹⁰

Relevant to: NHE England and Local Dental Network

9. Consistent approach to 'Making Every Contact Count' by a skilled workforce across local dental health services; seek to improve the delivery of preventative dental care; and decrease the prescribing of antibiotics.

Relevant to: NHS England and Local Dental Network

10. Consider sustainable approaches to distribute oral health promotion materials (e.g. toothbrushes and toothpaste) to vulnerable children and to mitigate the risk associated with the absence of an oral health promotion service (e.g. workforce training).

Relevant to: Nottingham City Council

Service quality and accessibility

11. Improve access to dental services for vulnerable groups such as:

- i. Ensuring urgent care access for older people in care homes; including care home staff being trained to provide good oral health care within care homes following NICE guidance, *Improving oral health for adults in care homes*⁹¹
- ii. Continuity of care for those coming out of places of detention;⁹²

- iii. Integration of dental services in substance misuse pathways⁹²
- iv. Promotion of the NHS low income scheme⁹²
- v. Equity of access for those without a fixed address; and
- vi. Integration of oral health promotion in learning disability care pathways.⁹²

Relevant to: NHS England, Local Authority and Public Health England

12. Develop local pathways and protocols to ensure appropriate information sharing occurs between agencies involved in the care of children and young people, including dental practices, to identify children for whom dental neglect may be part of wider neglect / child protection concerns.

Relevant to: NHS England, Children's social care, Local Authority Public Health and Local Dental Network

13. Encourage parents in the City to attend a dental practice with their child before their first birthday, followed by regular visits to help children familiarise well with the environment and maintain good oral health.

Relevant to: All public sector agencies

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