

**Northumberland Oral Health Needs
Assessment**

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Version 8

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Participants in conducting this Oral health needs assessment

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Executive Summary

Introduction

Over the last forty years, the oral health in England has improved continuously and the oral health in Northumberland has also followed this pattern. Levels of dental disease in Northumberland are similar to those in England as a whole. Despite this positive trend, there are still many people suffering from preventable, poor dental health. Further focus is required to ensure further improvement in the oral health of Northumberland's residents, especially those with the greatest need.

Following the implementation of the Health and Social Care Act 2012 in April 2013, responsibilities for oral health improvement and oral health promotion lie with the Local Authority, with the commissioning responsibilities of dental services being mandated to NHS England. As part of their statutory duties, local authorities have commissioning responsibilities to provide oral health promotion programmes, to commission the dental epidemiology programme and to fund the

running costs of water fluoridation schemes where they exist. In areas, where there currently are no schemes of water fluoridation, the local authority needs to consider if implementing water fluoridation would be of benefit to its population (PHE 2014(e)).

This oral health needs assessment is the first assessment of Northumberland residents' oral health needs since the transfer in responsibilities. In describing the current oral health needs of the population, it sets a basis for a cyclic process of oral health needs assessments and helps strategic planning, to ensure the improving trend of oral health continues as well as contributes to reducing health inequalities.

Population and demographics

- The population size of Northumberland is 315,806.
- Northumberland's population profile shows a shift to higher age bands, with a significant increase in the population of the over 55 year olds, at the cost of the under 25 year olds, compared to the demographic profile of England as a whole.
- Projected growth in coming years suggests a further increase in the older age bands.
- The population of Northumberland is predominantly classed as "White British" (97.2% of the population), with little ethnic diversity.
- Deprivation levels in Northumberland overall are similar to those of England as a whole. However this overall level hides significant pockets of deprivation in some areas of the county, with 14 LSOAs in Northumberland being among the 10% most deprived according to the Index of multiple deprivation. Some wards in Northumberland have up to 45.6% of children living in child poverty and others having 28.1% of their populations living with income deprivation (more than double the English average).
- Healthy life expectancy averages at 63 years across Northumberland, however the impact of health inequalities is clearly visible with healthy life expectancy ranging from 51 years to 74 years in different areas across the county.
- The overall smoking prevalence in Northumberland in 2015 was similar to the England average with a prevalence of current smokers being 16.6%. Smoking rates at time of delivery, with 15%, was significantly worse than for England as a whole. Smoking rates are not distributed evenly across the county with increased rates in areas of higher socioeconomic deprivation.
- Problematic alcohol consumption follows a similar distribution as smoking prevalence, and Hospital admission for alcohol-related conditions (822 per 100,000 population) as well as Alcohol-specific mortality (14.9 per 100,000 population) were significantly worse for Northumberland overall compared to the English average.

Determinants and impact of oral health

- A number of determinants have been identified to be linked to an increased risk of poor oral health in individuals and societies. Among these established risk factors are; living in an area of deprivation; being from a lower socioeconomic group, or living with a family in receipt of income support; suffering from substance abuse; having a chronic medical condition; belonging to a family of Asian origin or living with a Muslim family where the mother speaks little English.

- Poor oral health impacts significantly on individuals and societies. Poor oral health negatively impacts the individual overall health and wellbeing. In children, poor oral health can negatively affect their ability to thrive, develop and learn. Good oral health has been linked to higher levels of school readiness.
- The economic impact from work absences as a result of poor dental health has been estimated to be £36.6 million in the UK in 2012 (British Dental Health Foundation), with an additional cost relating to the annual direct spend of £3.4 billion per year by NHS England on dental care (with an additional estimated £2.3 billion being spent on private dental care annually).

Epidemiology of oral disease

- The overall prevalence of dental decay among three-year olds in Northumberland is comparable to that of England overall. However, the rate of Early Childhood Caries (ECC)¹ was the fourth highest in Northumberland, compared to the rest of the North East.
- The prevalence of dental decay among 5-year olds in Northumberland is comparable to the England average, however the overall rates mask significantly higher rates of dental decay² (measured as % d₃mft>0) in areas higher levels of socioeconomic deprivation across Northumberland.
- The difference of the percentage of 5 year olds having experienced dental decay (measured as % d₃mft>0) in Northumberland varies from 13% (among the least deprived) to over 40% in the most deprived quintiles (according to 2010 Index of multiple deprivation).
- The prevalence of 12 year olds having experienced dental decay (measured by % D₃MFT >0) in 12 year olds to be significantly higher (45.3%) among 12 year olds in Northumberland, compared to England as a whole (33.4%). Regionally this level is the third highest in the North East (after Middlesbrough and Darlington).
- The care index (is the percentage of teeth with decay experience which have been filled (FT/ D₃MFT) for 12 year olds in Northumberland (32%) is significantly below the England average (47%). This indicates that the dental care needs of 12 year olds are currently not met.
- The oral health of 12 year olds is potentially an area of unmet need that has the risk of impacting lifelong dental health and dental health associated quality of life.
- Findings from the Health Related Behaviour Questionnaire (HRBQ) among secondary school children in Northumberland suggest a good engagement with good health related practices, which are in contrast with the potentially high unmet oral health need.
- The oral health of young people is identified as an area of importance to address as a result of this oral health needs assessment.
- Nationally, adults are retaining their teeth longer, which lead to an increase in the number of restored teeth among the older age groups.
- To ensure that services meet the needs of Northumberland's aging population, the findings of the 2015/16 National Oral Health Survey of Older People will be an important source of further information.

¹ Early Childhood Caries (ECC) is the presence of one or more decayed (non-cavitated or cavitated lesions), missing teeth (due to caries), or filled tooth surfaces in any primary tooth in a child 72 of months age or younger, and linked to the use feeding bottles, especially with sugar sweetened-beverages.

² Dental decay measured as % d₃mft>0, that is evidence of decayed, missing or filled primary teeth.

- The majority of adult population retain their natural teeth, with only 8% of adults across the North East being categorized as edentate. 82% of adults in the North East had more than 21 natural teeth. However only 10% of adults met the criteria to be considered of being “with excellent oral health”³. About a third (34%) of dentate adults in the North East have any carious teeth.

Oral Healthcare services

- Northumberland is characterised through a significant percentage of the population living in rurality with some larger cities and urban areas, especially on the coast. Thus a particular issue for those living in the rural areas of the county is access to dental care.
- Access to NHS dental care varies by age bands with a peak attendance of just over 75% in children aged 5-9 years and a drop in NHS dental care attendants in young adults (15-19 years and 25-29 years) to under half of all residents accessing NHS dental care.
- Access to NHS care also varies significantly between different wards in Northumberland, with under 40% of residents attending NHS dental care in some wards and the highest attendance being 68% of residents in other wards.
- Distance travelled to NHS dental care by patients is a significant issue in the rural setting of Northumberland, with just over 40% of all patients having travelled 5 miles or more to their NHS dentist.
- Access to fluoride varnishes are provided by dentists across Northumberland following individual risk assessment of patients. There is no programme of fluoride varnish application for children not attending their dentist.
- Community dental services are provided through Northumbria Healthcare NHS Foundation Trust.

Dental Public Health Services

- Local authorities are responsible for improving the oral health of their population. They have responsibility for commissioning oral health improvement programmes and oral health surveys. They also have powers relating to making proposals regarding water fluoridation for their local population
- Northumberland County Council currently commissions oral health promotion programmes targeted in particular at children and older people, as well as children and adults with special needs delivered through Northumbria Healthcare NHS Foundation Trust.
- Northumberland has a water fluoridation programme which originated in 1968. The area covered by the current water fluoridation arrangement is patchy, and a large number of areas with populations at high risk of dental decay are currently not receiving fluoridated mains water supplies.
- The rates of hospital admission for dental extraction for dental decay in children and young people aged 0-19 years under general anaesthetic were twice as high in areas not benefitting

³ Office for National Statistics. Social Survey Division, Information Centre for Health and Social Care. (2012). *Adult Dental Health Survey, 2009*. [data collection]. 2nd Edition. UK Data Service. SN: 6884, <http://dx.doi.org/10.5255/UKDA-SN-6884-2>

from community water fluoridation, compared to those receiving fluoridated water, when adjusting for levels of deprivation in Northumberland.

Patient and public engagement

- A local survey was conducted to obtain an understanding of oral health of Northumberland's residents. The majority of participants in the oral health questionnaire described having adopted good dental hygiene practices.
- It is important to consider that the public engagement is not representative for all residents in Northumberland and those with the highest needs are often the ones less likely to participate in the form of public engagement that was conducted.

Key recommendations from the Oral Health Needs Assessment

- Future oral health improvement services need to contribute to reducing health inequalities in Northumberland.
- A future strategy for oral health in Northumberland should ensure it addresses issues related to the expected increase in the older age population, as well as continuing to address oral health needs in the early years (0- 5years) as well as for young people.
- For Northumberland County Council to ensure that oral health is an integrated part of all relevant service specification in children and adult Health and Social care.
- To work together with its partners, of promoting the importance of oral health on individual's health, and to ensure that oral health related aspects are addressed in line with a common risk factor approach.
- For Northumberland County Council to work on improving meeting the NICE guidance(PH 55) further.
- For Northumberland County Council to explore the feasibility of extending the current water fluoridation scheme, to provide a more equitable scheme , ensuring those at greatest needs are also receiving fluoridated mains water supply to aid reducing health inequalities.
- To work together with NHS England to ensure NHS dental care is accessible to all of Northumberland's residents.

Next steps

This oral health needs assessment represents the first step in the ongoing assessment of the oral health needs of the population of Northumberland since the 2012 Health and Social care act, and with it the transfer of responsibilities of oral health improvement and promotion to the local authority. Further exploration of the areas identified in this assessment as well as a strategy to address the needs will have to be developed and the ongoing assessment of changing needs planned into this strategy moving forward.

Introduction

Oral health is an important part of the overall health and wellbeing of individuals. Poor oral health can have significant restricting consequences to overall health and wellbeing, and prevent individuals from fulfilling their full potential. Thus good oral health that is absence of oral disease, allowing unrestricted functionality in relation to eating, speaking and socialisation, is an important requisite for the health and wellbeing of the population.

The Health and Social Care Act 2012 transferred the responsibilities of commissioning dental services to NHS England, and the responsibilities for improving local population's health and commissioning oral health improvement services to the Local authorities. Among the statutory responsibilities of local authorities are assessing and monitoring health needs, as well as planning and evaluating oral health promotion and oral health improvement services.

In order to comply with its statutory mandate, Northumberland County Council conducted a thorough oral health needs assessment which will form the foundation for an oral health strategy ensuring that the oral health needs of local communities are addressed.

Oral health can be defined as "a standard of the oral and related tissues which enables an individual to eat, speak and socialise without active disease, discomfort or embarrassment and which contributes to general wellbeing".

An oral health needs assessment allows the identification of the specific oral health needs of the population, which in turn allows targeted resource allocation to address the needs within different population groups.

Background

There is robust evidence, of the steady and sustained improvement in oral health across the UK, over the last decades (NICE 2014). The reduction in dental caries prevalence that has been noted, has

been attributed mainly to the widespread use of fluoride toothpaste, as well as an improvement in oral hygiene behaviour among the population (NICE 2014; White 2012; Macpherson 2013). Despite these positive trends, dental health remains an important public health issue in most developed countries (Marthaler 2005) and health inequalities are still very visible in dental health in the UK today, with socioeconomic status having been identified as a key determinant for poor oral health (NICE 2014 referring to BDA 2013).

Oral Health was defined by WHO in 1982 as: “a standard of the oral and related tissues which enables an individual to eat, speak and socialise without active disease, discomfort or embarrassment and which contributes to general wellbeing” (US department of Health 2000). This definition highlights the importance of good oral health on individual's health.

Oral health contributes significantly to general well-being, and poor oral health, has the ability to restrict individuals' ability to eat, speak and socialise because of discomfort or embarrassment (Alsumait 2015).

The implementation of the Health Service Reforms in April 2013 have led to the transfer of responsibilities in relation to access to dental care to Local authorities (Landes 2013). Dental services are commissioned by the NHS England Local area teams who work together with the Local Authority, usually through Health and Wellbeing boards, to ensure the delivery of services, meets the needs of local populations (Landes 2013).

Northumberland, the most northern county in England, has overall dental health indicators that are similar to the national average. Despite this, the overall outcome measures mask pockets of inequalities and areas of greater need across Northumberland. As dental decay is a largely preventable problem, dental health strategies and dental care services need to address the oral health needs of the entire population, with a particular focus on the oral health of those, most at risk of dental diseases.

Despite this impact on wellbeing, oral health is often not sufficiently prioritised. However, many of the known risk factors for oral health are the same as for other chronic conditions like cancer, diabetes and cardiovascular disease. Therefore strategies addressing these established risk factors, like diet, smoking, alcohol and stress, are likely to also have a positive impact on the dental health of the population (NICE 2014 guidance 55, Watt and Sheiham 2012), making the common risk factor approach useful for addressing dental health among the population.

National Policy context:

A number of national policies relate to the importance of addressing dental health of the population, especially for children and young people. The importance is highlighted, through a number of indicators relating to the dental health of children having been included in the public Health Outcome Framework. These dental health **indicators are:**

- * Tooth decay in children age 5
- * Mortality from cancer (this includes oral cancer)

Other indicators that can potentially be influenced by oral health:

- * Pupil absence
- * Sickness absence rates
- * Self-reported wellbeing

* Health-related quality of life for older people

Indicators with a link to oral health- improving outcomes from these indicators could have positive impact on oral health:

- Children in poverty
- Homelessness
- Breastfeeding
- Smoking (at delivery, smoking prevalence in 15 year olds and adults)
- Diet
- Alcohol (alcohol related admission to hospital/ mortality from liver disease)
- Cancer diagnosed at stage 1 and 2 (in the case of oral cancers)

The numbers of indicators that are linked to dental health, highlight the importance for local authorities in addressing the dental health of their population. A detailed overview of some of the national policies relevant to dental health, can be found in Appendix 1 of this document (Appendix 1) .

NICE⁴ has issued guidance for Local Authorities to help improve the dental health of their populations (NICE 2014 -PH 55). This guidance provides a useful overview for Local Authorities about areas to consider, when developing a dental health strategy.

The guidance puts forward the following 21 recommendations:

Recommendation number	Recommendation	Evidence from Northumberland County Council
Recommendation 1	Ensure oral health is a key health and wellbeing priority	Oral health in JSNA
Recommendation 2	Carry out an oral health needs assessment	This document
Recommendation 3	Use a range of data sources to inform the oral health needs assessment	See methodology
Recommendation 4	Develop an oral health strategy	Following on from OHNA
Recommendation 5	Ensure public service environments promote oral health	Better health at work award, Food & Drink
Recommendation 6	Include information and advice on oral health in all local health and wellbeing policies	Not currently, to work on promoting this further
Recommendation 7	Ensure frontline health and social care staff can give advice on the importance of oral health	Health promotion as part of the Health promotion contract commissioned currently aimed at 0-5 year olds
Recommendation 8	Incorporate oral health promotion in existing services for all children, young people and adults at high risk of poor oral health	Health school award scheme. Health promotion contract to deliver in special needs setting , currently working in specific localities.
Recommendation 9	Commission training for health and social care staff working with children, young people and	Currently not covered specifically as part of Oral

⁴ National Institute for Health and Care Excellence

	adults at high risk of poor oral health	Health Promotion service contract
Recommendation 10	Promote oral health in the workplace	Better Health at Work awards
Recommendation 11	Commission tailored oral health promotion services for adults at high risk of poor oral health	Part of Oral Health Promotion service contract for individuals with special needs, but current gap beyond this.
Recommendation 12	Include oral health promotion in specifications for all early years services	Currently not in specifications, but scope to extend this.
Recommendation 13	Ensure all early years services provide oral health information and advice	ChildSmiles awards scheme (but not in all services, only small number)
Recommendation 14	Ensure early years services provide additional tailored information and advice for groups at high risk of poor oral health	In some set ups through Family-Nurse partnership and ChildSmiles
Recommendation 15	Consider supervised tooth brushing schemes for nurseries in areas where children are at high risk of poor oral health	Offered in schools and nursery settings like Josephine Buttler, The Centre,
Recommendation 16	Consider fluoride varnish programmes for nurseries in areas where children are at high risk of poor oral health	Currently not a programme. Varnishes applied by dentists after their individual based risk assessment
Recommendation 17	Raise awareness of the importance of oral health, as part of a 'whole-school' approach in all primary schools	Wellbeing & Health Team , Health Schools Northumberland Award scheme
Recommendation 18	Introduce specific schemes to improve and protect oral health in primary schools in areas where children are at high risk of poor oral health	Offered in referral from Healthy Schools. Some as part of OHP Childsmiles award. Identification through Healthy Schools
Recommendation 19	Consider supervised tooth brushing schemes for primary schools in areas where children are at high risk of poor oral health	Offered in schools and early years settings , not implemented in most settings
Recommendation 20	Consider fluoride varnish programmes for primary schools in areas where children are at high risk of poor oral health	Currently not a programme. Varnishes applied by dentists after their individual based risk assessment
Recommendation 21	Promote a 'whole school' approach to oral health in all secondary schools	Healthy Schools Northumberland Award scheme

Table 1: Recommendations from NICE guidance PH 55 (NICE 2014) listed with evidence of how Northumberland is currently performing against these recommendations.

A more detailed review of the recommendation in relation to Northumberland, can be found in Appendix 2 of this document (Appendix 2).

Local Context

Health and wellbeing strategies across Northumberland

Health and Wellbeing boards were established in April 2013, with the implementation of the Health and Social Care Act 2012. The aim of Health and Wellbeing boards is to reduce health inequalities by bringing together organisations involved in commissioning and providing health services, adult social care and children's services and facilitate better partnership working. The vision of Northumberland's Health and Wellbeing board is *'to create a culture that allows the aspiration of residents and communities to be fulfilled'*. Among other things, it envisages to give every family the best start to life, to ensure everyone is treated fairly, feels included and has the opportunity to fulfil their potential and to champion a preventative approach to ill-health and the wider factors that contribute to it.

The Health and Wellbeing board in Northumberland County Council reviews and updates the health and wellbeing strategy on an annual basis.

The health and wellbeing strategy is based on 5 key priorities that the work around health and wellbeing in the County builds upon.

These 5 key priorities are:

- Focus on children and families , who without some extra help and support early on, would be at risk of having poorer health, not doing as well at school and not achieving their full potential
- Focus on tackling some of the main causes of health problems in the county including obesity and diet, mental health and alcohol misuse
- Support people with long-term conditions to be more independent and have full choice and control over their lives.
- make sure all partners in Northumberland work well together and are clear about what they themselves need to do to help improve the health and wellbeing of local people
- Make sure all public services support disabled people and those with long term health conditions to stay active for as long as possible.

As is highlighted further on in this oral health needs assessment, poor oral health and dental decay has the ability to negatively impact the overall health of individuals, and especially in children can have an impact on their ability to eat, speak, socialise and learn thus reducing the likelihood of them achieving their full potential (Alsumait 2015; Seirawan 2012). Thus addressing the oral health of the population is an important contributing factor to Northumberland County Council achieving positive progress on their key priorities.

In order to meet the oral health related needs of the population, and achieving better oral health of the population, different partners in Northumberland are likely to have to work together well, in order to achieve this ambition.

Joint Strategic Needs Assessment

The Joined Strategic Needs Assessment (JSNA) for Northumberland is in the progress of being revised, and dental health has been identified as one of the priorities to focus on within it.

The findings from this Oral Health Needs Assessment will inform a dental health strategy moving forward, and thus be in line with the priorities identified by Northumberland Local Authority through their JSNA

Role of the Local Authority

The implementation of the Health Service Reforms in April 2013 has led to the transfer of responsibilities in relation to access to dental care to Local authorities (Health and Social Care Act 2012⁵). Dental services are commissioned by the NHS England Local area teams who work together with the Local Authority, usually through Health and Wellbeing boards, to ensure the delivery of services, meets the needs of local populations (Landes 20113). The local authority also holds responsibility for commissioning oral health promotion services, as well as commissioning the dental epidemiology programme and to fund the running costs of water fluoridation schemes where these exist. The Local Authority also needs towards the public health outcome indicators, as mentioned above, some of the directly relate to dental health, whereas others can be influenced by dental health factors.

Focus on reducing health inequalities

Inequalities in health are still an important issue in the UK today. This is reflected through a difference in healthy life expectancy, as well as life expectancy overall between the rich and the poor, but also through worse oral health for socio-economically disadvantaged groups. Children from lower income families have higher rates of dental disease (HSCIC 2015) and experiencing socioeconomic deprivation is recognised as a risk factor for dental decay (NICE 2014 guidance 55). Addressing the oral health needs of the population therefore is also an important opportunity in reducing health inequalities in the population. Since the 1st of October 2015, commissioning responsibilities of the Healthy Child Programme for 0-5 year olds also fall under the remit of local authorities, and this is therefore an opportunity, of ensuring oral health is embedded in the Healthy Child programme, with the potential of improving oral health outcomes for children, and reducing inequalities (LGA 2014).

Impact of oral health

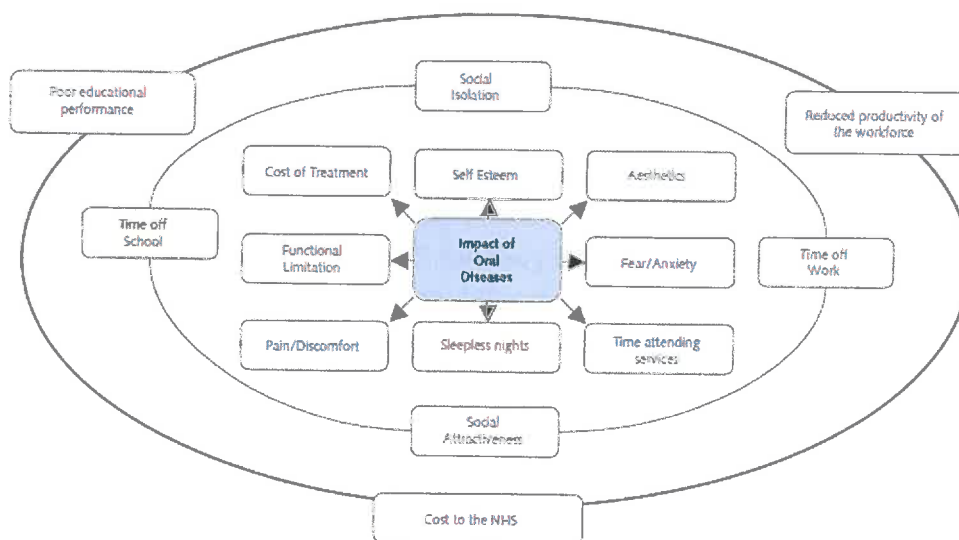
Oral health is linked to well-being, and poor oral health can restrict the ability to eat, speak and socialise because of discomfort or embarrassment (LGA 2014; Alsumait2015). Poor oral health can have a significant impact on an individual's quality of life.

⁵ Available online: <http://www.legislation.gov.uk/ukpga/2012/7/contents/enacted>.

As an example for this, pain caused by dental caries, and other oral conditions, has the potential to negatively impact on educational outcomes. A study conducted among disadvantaged school children in America found children with toothache to be more likely to have low school grades, and to miss time off school (Seirawan 2012).

A number of measures to assess the impact of oral health on children's health and wellbeing have been developed to assess their oral health-related quality of life (OHRQoL) (Gilchrist 2014). The OHRQoL combines measures in 4 domains: oral symptoms, functional limitations, social well-being and emotional well-being (Alsumait 2015). Patient reported assessments of their OHRQoL are a useful way of assessing the impact of dental issues on children and adults, and this is an important element that decision makers should consider.

Long term consequences of dental caries in children have been described as impacting on growth and cognitive development, through lack of nutrition, as well as lack of concentration while at school, as well as being associated with the development of further dental problems as the children get older (Gussy 2006). The findings from a 2013 self-reported patient questionnaire highlighted this; a fifth of 12 and 15 year olds experienced difficulties in eating in the 3 months preceding the survey, and about a third reported being embarrassed to smile or laugh because of their teeth (HSCIC 2013).



Source: Modified from Department of Human Services (1999)

Figure 1: Impact of oral disease, copied from Choosing Better Oral Health (DoH 2005).

The Dental Health Survey 2013 found in their self-completion survey that more than a third (35%) of 12 year olds and just under a third (28%) of 15 year old mentioned that they had been embarrassed to smile or laugh because of their teeth.⁶

⁶ <http://www.hscic.gov.uk/article/6181/More-than-a-third-of-12-year-olds-embarrassed-to-smile-because-of-their-teeth>

The impact of dental caries as well as other dental conditions, including dental fluorosis is important to consider. Studies have assessed the effect of dental caries (Alsumait 2015, Do 2007) and dental fluorosis (Do 2007) on OHRQoL of children. Unsparingly, dental caries was associated with a reduced OHRQoL. Other dental health related issues also have an impact on the overall health and wellbeing of the population. Oral hygiene and oral health related practices are not just important in the prevention of dental decay, but also in relation to periodontal disease.

Periodontal disease has a particular link with diabetes, and periodontal disease can have a negative impact on HBA1c levels and glycaemic control among patients living with diabetes (PHE 2014 f).

Poor oral health can also have a significant economic impact. For organisations, improving oral health can reduce the negative impact from employee absenteeism, but also presenteeism⁷. The impact on the economy from work absences was estimated in the range of £36.6 million in 2012, and a nationwide survey conducted by the British Dental Health Foundation) in 2012, estimated 415,000 employees taking time off work as a result of dental problems, and 1.1 million people taking time off work to care for their child, as a result of oral health related issues⁸. This is in addition to the cost of treating dental disease and its complications.

Oral Health Needs Assessment Methodology:

The purpose of an oral health needs assessment (OHNA), as stated by NICE (NICE/PH55, 2014), is to describe the oral health of the whole population in order to allow the targeting of resources towards improving the oral health of those at specific risk (or in underserved population groups) (Chestnutt 2013). In order to achieve this, an assessment of the oral health of the population needs to be made in order to determine their needs and map them to existing services and service gaps (Chestnutt 2013). Obtaining the required evidence on a local footprint can be challenging based on limitations of existing routinely collected data. The NICE guidance “ Oral health: local authority strategies to improve oral health, particularly among vulnerable groups” advises a 10 stepped approach to conducting and oral health needs assessment, which is in line with principles for quality joint strategic needs assessment and joint health and wellbeing strategies (PHE 2015 (c)).

	Oral Health Needs Assessment: 10 steps:
Step 1	Establish a partnership or reconvene an established OHNA group
Step 2	Agree, scope, goals and timescale
Step 3	Collate existing OHNAs and additional relevant information to hand
Step 4	Identify and close information gaps Use a range of approaches to build a comprehensive picture of needs and assets
Step 5	Analysis, synthesis and consideration of information secured to the point of developing a shared priority for potential action. Optional consultation/ economic analysis.

⁷ Presenteeism, is the practice, of coming to work, in spite of an issue related to the individual's health or wellbeing, associated with reduced productivity in the time the individual is present at work.

⁸ Information from: <https://www.dentalhealth.org/news/details/719>

Step 6	Consideration of the various actions which could be taken to address the problems identified in step 5
Step 7	Identification of how, within the local context of partnership working , organisational responsibilities and decision making the actions to be implemented by those with the power to take action
Step 8	Final consultation phase on recommendations
Step 9	Communication and influence to enable actions to be taken
Step 10	Reviewing whether the actions have been taken and the impact they have had where implemented
	Restart step 1 when appropriate.

Table 2: 10 steps of Oral Health Needs Assessment methodology (PHE 2015 (c)).

This oral health needs assessment was conducted as a first scoping, and a slight variation on this approach was used, in that a formal oral health needs assessment group was not convened for this oral health needs assessment. A small task and finish group was initially convened to scope the oral health needs assessment and as part of the information gathering process, other stakeholders were involved. This oral health needs assessment was conducted as a “table top exercise” drawing on available data to obtain a first idea of the oral health needs of the population. It is expected that more in depth exploration in specific areas will be required in future.

Following the completion of this table top oral health needs assessment , it is proposed that an oral health needs and strategy group be convened, to oversee the next steps of developing and implementing the oral health strategy and conduct further oral health needs assessment.

The oral health needs assessment draws on a range of existing sources of information to establish the picture of the oral health needs of the populations in the county. The data sources used will be presented further in the relevant sections.

As part of the community engagement process, primary data collection was conducted; however all the other information presented here in this oral health needs assessment was not collected specifically for the purpose of conducting a health needs assessment. Thus there are limitations regarding the use of this data, and some limitations around the information that can be derived from it.

Aim:

This oral health needs assessment has been conducted in line with guidance from NICE, which has been referred to above (NICE 2014 guidance 55). The aim of this oral health needs assessment is to map current oral health provisions to oral health needs of the population as well as best practice advice. It will help identify areas of need to be addressed in the oral health strategy, as well as aid cost-effectiveness of provisions.

Objectives

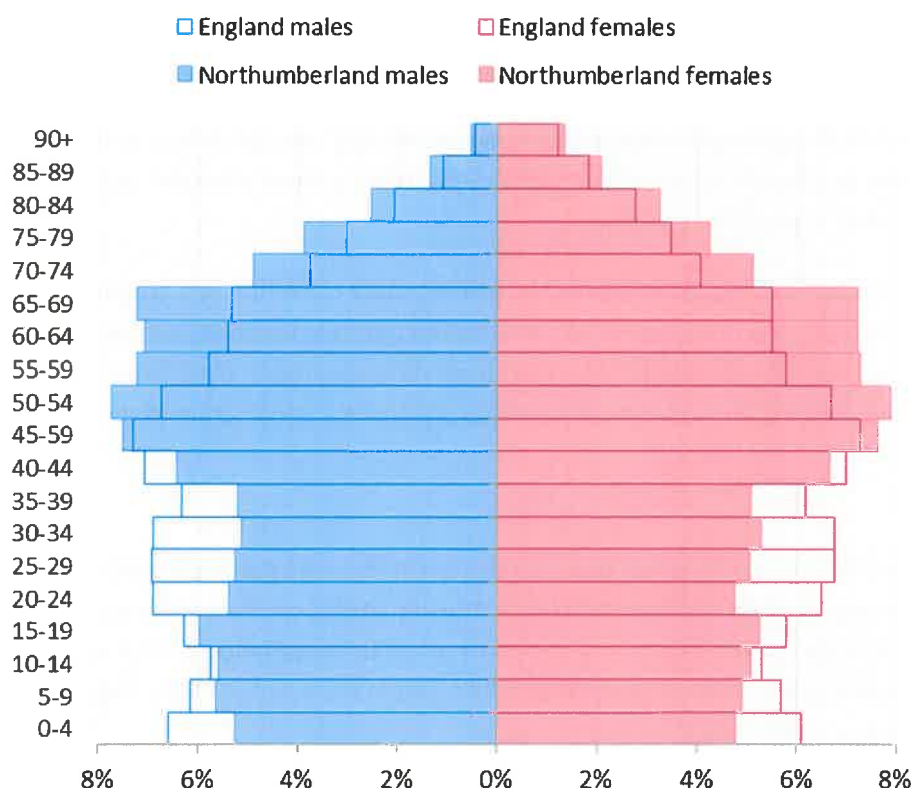
- To present an overview of Northumberland and its population in relation to its relevance to oral health needs
- To describe the oral health needs of the population of Northumberland
- To describe current oral healthcare services

- To identify gaps in current oral healthcare services
- To identify how compliant with national recommendations the services in Northumberland are
- To highlight areas of unmet or under met need in relation to oral health across different population groups in Northumberland currently, and the predicted implications for the future, to inform an oral health strategy and to allow resource planning for the Local Authority.

Population and Demographics

Northumberland is England's most northern County. Most of Northumberland's land border is with Scotland. Nearly all (97 %) of Northumberland is classed as rural with a number of bigger towns like Hexham, Morpeth, Alnwick, Ashington on the coast and Berwick on the Scottish border. Some of the population live in areas that are considered the remotest areas in England – 7 Lower Layer Super Output Areas (LSOAs⁹) in the county have a population density of less than 10 people per km². Northumberland is a largely rural population, with 70.8% of the population living rurally (including hub towns) (DEFRA 2015).

The general population of Northumberland is 315,806 in an area comprising 5,013km² leading to a sparse population density of 63 people per km².



⁹ LSOAs were defined to aid small area statistics, and LSOAs are a geographical area that include a population size of between 1,000- 3,000.

Figure 2: Population structure of Northumberland compared to England (Data source: ONS mid-2014 population estimates)

Household density in 2011 was 28 households per km^2 . (England /Wales average: 155 households per km^2)¹⁰.

The age distribution in Northumberland differs to that of the England population with an increase in the population of individuals aged over 45 years and most significantly in the age groups above 55 years of age. As Figure 2 shows, there is an increase in the number of people aged 65 years and over compared to the England average (increase by 4.5%). This increase comes at the cost of the younger populations, particularly the under 25 year olds (4.2% less compared to England average for those aged under 16 years as well as for the 16-24 year olds. Life expectancy for men, 79.2 years, is similar to the England average, but life expectancy for women, 82.5 years, is slightly, but statistically significantly, below the England average. (PHE data, Health Profile 2015)

The population in Northumberland is characterized through little ethnic diversity, with 97.2% of the population being classed as "White British". In the 2011 census, only 2.8 % of the Northumberland population classed themselves as not "White UK" (in England as a whole this was 20.2% of the population). The percentage of Northumberland Black and Minority Ethnic (BME) residents was only 1.6% (England average 14.6%). Figure 3 shows the distribution of BME population across Northumberland. The population that cannot speak English well or at all is low, with only 0.2% (England overall: 1.7%).

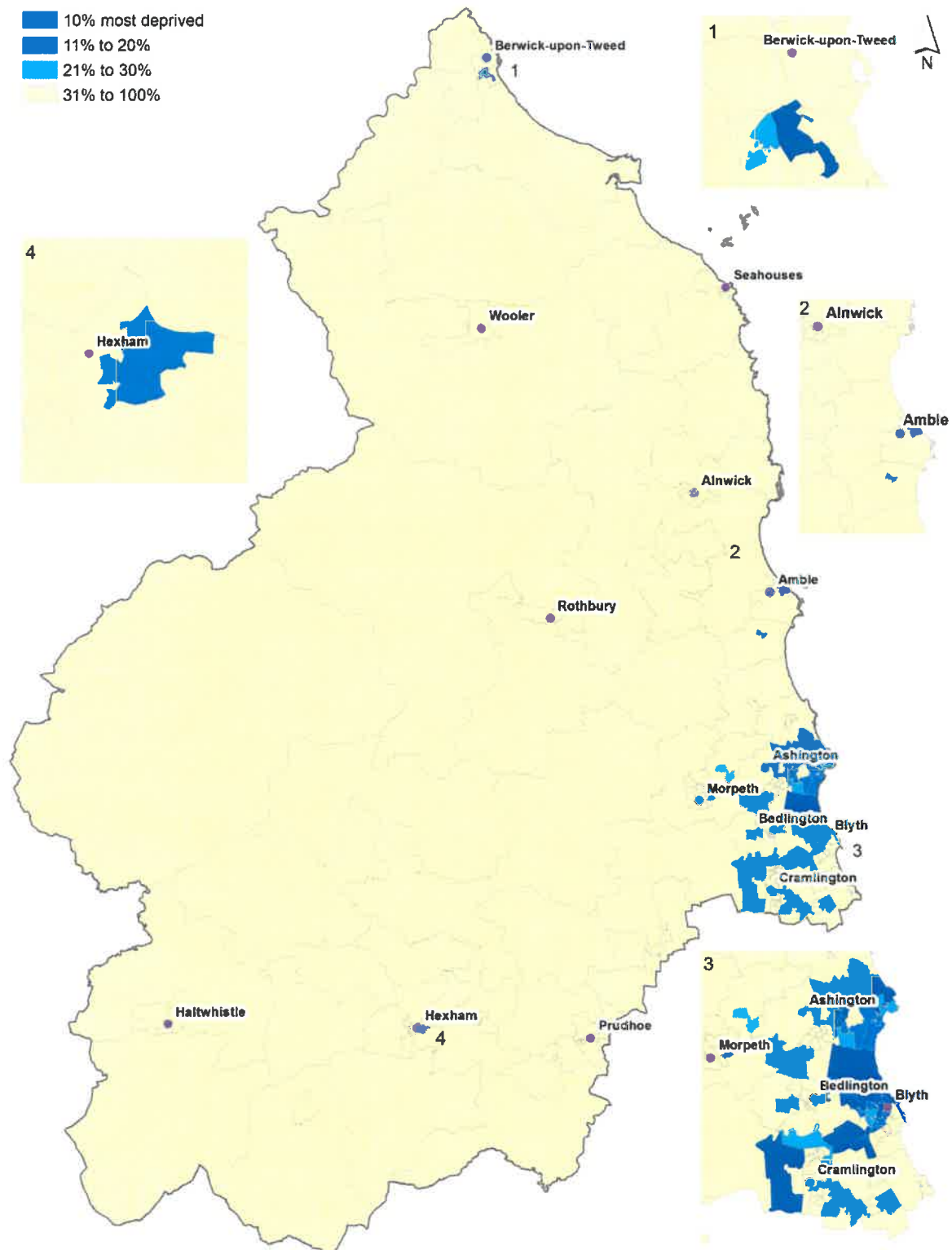
Despite Northumberland having lower overall levels of deprivation, compared to England as a whole, there are pockets of high deprivation, with some areas having as many as 45.6 % of children living in child poverty (Newbiggin Central & East) and 28.1 % of the population with income deprivation (Kitty Brewster), more than double the national average.

Figure 4 shows the distribution of areas with higher Deprivation across Northumberland. This highlights that the highest levels of deprivation are found on the South East coast, and around Berwick in the North. Increased prevalence of lifestyle factors associated with poor oral health (like increased alcohol consumption, smoking, decreased breast feeding) follow the same distribution as the areas of deprivation. A more detailed description of the demography of Northumberland and distribution of lifestyle factors and Health Indicator, can be found in Appendix 3 of this document (Appendix 3).

Northumberland has significantly higher hospital attendance and admission rates for children, when compared to England, as well as significantly worse adult lifestyle indicators, including healthy eating.¹¹

¹⁰ ONS data, taken from: <http://www.northumberland.gov.uk/default.aspx?page=15753>.

¹¹ Full Health Profiles: www.apho.org.uk/resource/item.aspx?RID=171627.



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Produced by the Corporate Research Team, Information Services, Northumberland County Council.

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Figure 3: Map of the most deprived areas for the 2015 Income Deprivation Affecting Children Index (IDACI) (Source: Northumberland Knowledge Research Report, 2015)

Determinants and Impacts of Oral Health

Determinants

A number of established risk factors for poor oral health have been identified in the UK context, and are described by Rayner et al. and the Department of Health (Rayner et al 2003; Department of Health 2007 referred to in NICE guidance 55). These risk factors are:

- Living in area of deprivation
- Being from a lower socioeconomic group or living with a family in receipt of income support
- Belonging to a family of Asian origin or living with a Muslim family where the mother speaks little English
- Substance abuse
- Having a chronic medical condition

With these risk factors in mind, this oral health needs assessment aims to specifically review local data with a specific focus on populations meeting these risk factors.

Impacts of poor oral health

The impact of dental decay can be significant. Dental decay causes pain, which can be disruptive to sleeping and the full function of the affected individual. Above this, the consequences of dental decay can have a significant impact on the health and wellbeing of individuals, with poor dental health having been well documented to be associated with sleep deprivation, depression and multiple adverse psychosocial outcomes (US Department of Health 2000). Poor oral health can impair people's ability to fully enjoy life through the impact on eating and self-esteem through pain and cosmetic concerns.

Dental decay is known to have a significant impact on children's health and well-being as well as potentially on their school readiness, and ability to learn. Early Childhood Caries (ECC) has been shown to negatively impact on children's development, school performance as well as behaviour (Casamassimo 2009).

The 2013 dental survey (HSCIC 2015) assessed the impact of dental health on children aged 12 and 15 through collecting self-rated oral health related quality of life as well as the Child Oral Impacts on Daily Performance measure (Child-OIDP) in the 3 months preceding the survey date. The survey found 58% of 12 year olds, and 45% of 15 year olds to have had at least one oral health related impact, with about a third (36% of 12 year olds, and 27% of 15 year olds) stating they were embarrassed to smile or laugh, and a fifth (22% of 12 year olds and 15% of 15 year olds) experiencing difficulties in eating (HSCIC 2015).

Beyond the significant impact on individual's health and wellbeing, there is also a significant economic impact resulting from work absence related to poor dental health. This impact was estimated to be in the range of £36.6 million in 2012, and a nationwide survey conducted by the British Dental Health Foundation¹² in 2012, estimated 415,000 employees taking time off work as a

¹² Information from <https://www.dentalhealth.org/news/details/719>

result of dental problems, and 1.1 million people taking time off work to look to care for their child, as a result of oral health related issues.¹³

In addition to this, dental treatment itself adds a significant financial burden to the NHS, with NHS England spending an estimated £3.4 billion per year on dental care, with over a million patient contacts made with NHS dental services each week (PHE 2014 (commissioning better oral care)). In addition to this, it is estimated that the English public spent an additional £2.3 billion on private dental care each year ((PHE 2014 (commissioning better oral care))

Epidemiology of Oral Disease

Dental decay (Dental caries)

Over the last 20 years, dental health has been improving in Northumberland in line with improvements in England. Levels of tooth decay are now lower than they were even 10 years ago. National surveys, assessing the dental health of children have been undertaken in England since 1973. The surveys document the decline in dental caries in children well, and this improvement has been attributed greatly to an introduction of fluoride containing toothpaste (PHE 2015(d)). Despite this positive change, there are still a significant number of children experiencing tooth decay (27.9% In England in 2012). Most recent figures, from the Child Dental Health Survey 2013 were published in March 2015 (HSCIC 2015). This survey showed, nearly half of all 15 year olds(46%) and about a third (34%) of 12 year olds in England, to have obvious decay experience in their permanent teeth and similarly, a third (31%) of 5 year olds and nearly half (46%) of 8 year olds to have obvious decay experience in their primary teeth (HSCIC 2015). The survey also confirmed the well-established link between dental decay in children and socioeconomic status of the family; when comparing dental decay experience between children eligible for free school meals¹⁴, and those not eligible for free school meals, the percentage of children having severe or extensive dental decay was nearly double in children eligible for school meals (for 5 year olds: 21 % compared to 11% and in 15 year olds: 26% compared to 12%). Dental decay is linked to lifestyle factors, as well as oral hygiene and access to dental services. Levels of caries show a positive correlation with increasing levels of deprivation.

Data from the 2012 national dental epidemiological survey of 5 year olds , show the overall mean number of teeth per child that were either actively decayed or had been filled or extracted (d₃mft) in children aged 5 years of age to be 0.92 (95% CI: 0.83-1.00) in Northumberland. This was similar to the England average of 0.94 (95% CI: 0.93-0.96). The number of children in Northumberland with one or more decayed, missing or filled teeth was 27.6 (95% CI: 27.7- 28.1) which was also similar to

¹³ Information from: <https://www.dentalhealth.org/news/details/719>

¹⁴ Children in full-time education in year 3 or above are eligible for school meals if the parents receive income support, income-based Jobseeker's Allowance, income-related Employment and Support Allowance, Support under Part VI of the Immigration and Asylum Act 1999, the guaranteed element of Pension Credit, Child Tax Credit, Working Tax Credit or Universal Credit. Numbers of children eligible for free school meals are often used as a proxy measure for levels of socio-economic deprivation.

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the England average of 27.9 (95% CI: 25.7-29.6). However these rates mask areas of significantly worse dental decay in specific areas in Northumberland.

Tooth decay in children aged 5 2011/12

Crude rate - mean dmft per child

Area	Count	Value	95% Lower CI	95% Upper CI
England	-	0.94	0.93	0.96
North East region	-	1.02	0.98	1.05
Hartlepool	-	0.56	0.44	0.68
Gateshead	-	0.72	0.63	0.82
Newcastle upon Tyne	-	0.75	0.65	0.86
North Tyneside	-	0.83	0.74	0.92
South Tyneside	-	0.88	0.75	1.01
Northumberland	-	0.92	0.83	1.00
County Durham	-	0.93	0.86	1.00
Stockton-on-Tees	-	1.12	1.01	1.23
Darlington	-	1.20	1.02	1.39
Redcar and Cleveland	-	1.30	1.14	1.45
Sunderland	-	1.32	1.20	1.43
Middlesbrough	-	1.71	1.54	1.88

Source: National Dental Epidemiology Programme for England, Oral Health Survey of five year old children, 2012

Children with one or more decayed, missing or filled teeth 2011/12

Proportion - %

Area	Count	Value	95% Lower CI	95% Upper CI
England	-	27.9	27.7	28.1
North East region	-	29.7	29.0	30.3
Hartlepool	-	19.6	16.6	22.6
Newcastle upon Tyne	-	22.6	20.3	24.9
Gateshead	-	25.8	23.3	28.2
County Durham	-	27.2	25.7	28.7
Northumberland	-	27.6	25.7	29.6
South Tyneside	-	27.7	24.7	30.7
North Tyneside	-	29.3	27.0	31.6
Darlington	-	29.4	26.1	32.7
Stockton-on-Tees	-	31.9	29.6	34.1
Redcar and Cleveland	-	35.9	32.8	39.0
Sunderland	-	36.9	34.6	39.2
Middlesbrough	-	41.5	38.6	44.5

Source: National Dental Epidemiology Programme for England, oral health survey of five-year-old children 2012

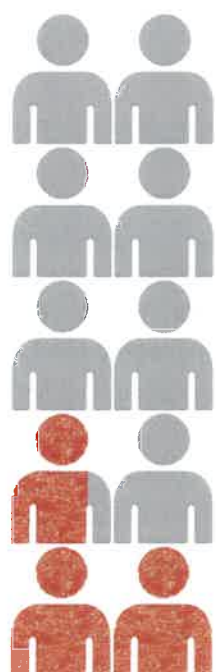
Table 3 : tooth decay in children, Table 1: mean severity of decay in children aged 5 years per locality, table 2: percentage of children aged 5 years in each locality with one or more decayed, missing or filled teeth. Data from PHE: <http://fingertips.phe.org.uk/search/dental>.

Despite levels of tooth decay in 5 year olds being similar to the national average, it is worse than Northumberland's statistical neighbour (East Riding of Yorkshire) (Table 4) and worse compared to some regional areas in the North East (Newcastle upon Tyne, North Tyneside, Gateshead and Hartlepool)(Table 3). The populations in these areas all receive fluoridated water, through either artificially fluoridated schemes (Newcastle upon Tyne, Gateshead, and North Tyneside) or through naturally occurring high levels of fluoride (Hartlepool). In Northumberland, there is a scheme of water fluoridation in place with Northumbrian Water; however the existing arrangements only cover some areas of the county, serving just under half of the overall population. See section on water fluoridation below, for further information.

	Northumberland local authority	Statistical neighbour: East Riding of Yorkshire local authority	North East	England
Average d ₃ mft	0.92	0.75	1.02	0.94
% with decay experience	27.6%	22.7%	29.7%	27.9%
Average d ₃ mft in those with decay experience	3.31	3.29	3.43	3.38
% with active decay	23.3%	20.1%	25.2%	24.5%
% with experience of extraction*	4.0%	2.2%	4.5%	3.1%
% with dental abscess	2.2%	3.2%	2.0%	1.7%
% with teeth decayed into pulp	2.9%	2.5%	4.9%	4.4%
% with ECC**	4.4%	5.8%	6.2%	6.3%
% with high levels of plaque present on upper front teeth**	2.2%	0.6%	1.9%	1.7%

Table 4: range of measures among 5 year olds in Northumberland local authority compared with their statistical neighbour (East Riding of Yorkshire), England and the rest of the North East. Data from PHE, Dental health profile, Northumbria, October 2014.

Nearly **3 in 10** children aged 5 have experienced decay



Average d₃mft in all 5-year-olds



Average d₃mft in 5-year-olds with decay experience

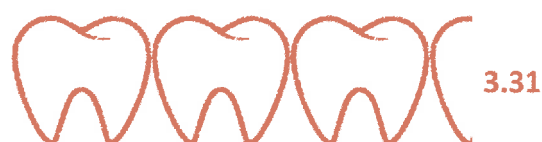


Figure 4: Number of children aged 5 years in Northumberland with decay experience and average number of teeth with decay experience in 5 year olds in Northumberland. (Data source: National Epidemiological survey 2014). dmft: average number of decayed, missing or filled primary teeth.

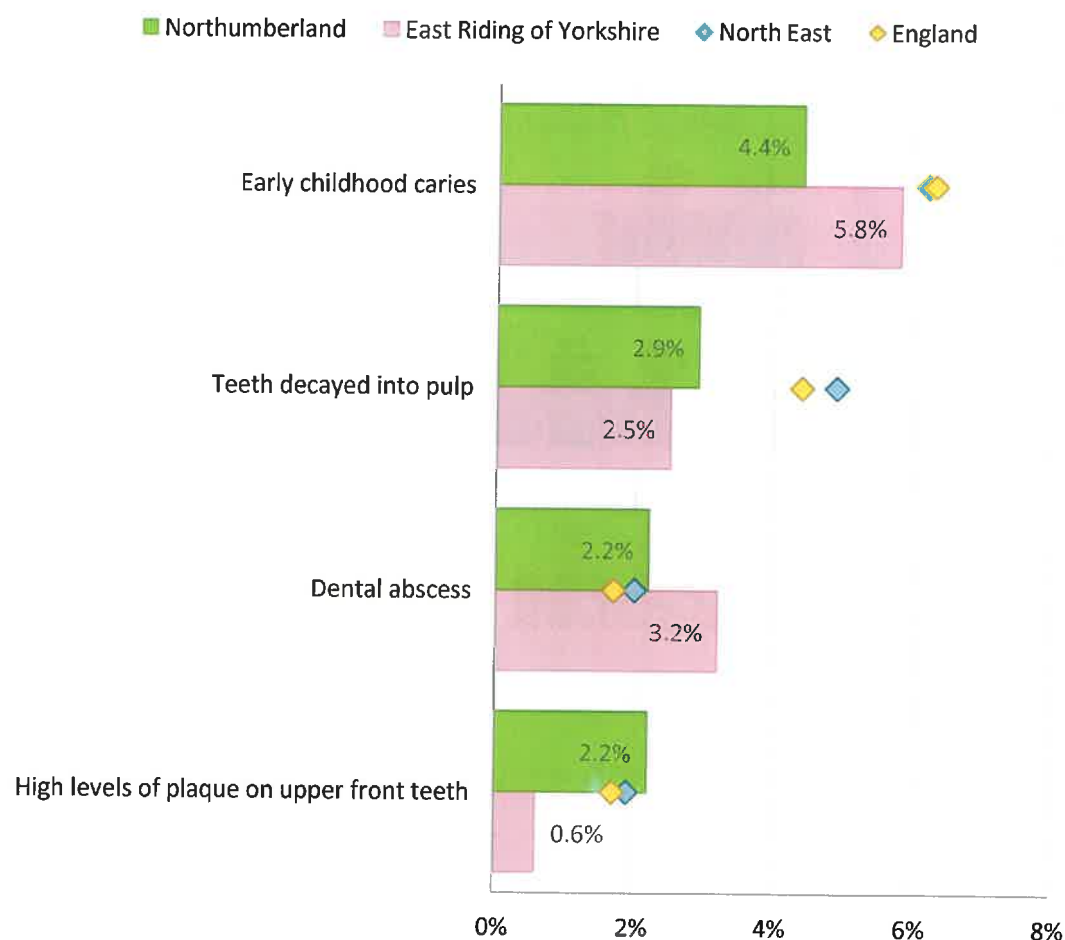


Figure 5: range of measures among 5 year olds in Northumberland local authority compared with their statistical neighbour (East Riding of Yorkshire), England and the rest of the North East. Data from PHE, Dental health profile, Northumbria, October 2014.

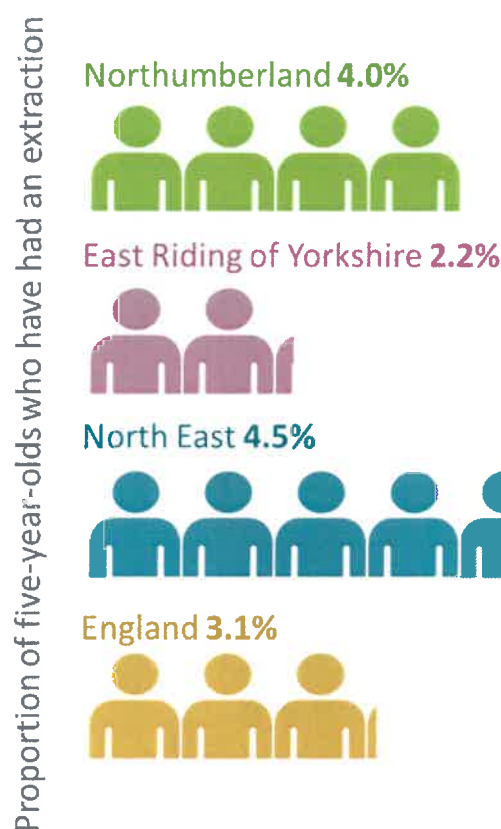


Figure 6: Proportion of five-year olds who have had a dental extraction (data source: data source: National Epidemiological survey 2014)

As previously mentioned, dental decay in children under 5 years of age, is not evenly spread across the county, but is more prevalent in some wards, compared to others

The link between increased prevalence of dental decay and Index of Multiple Deprivation is also evident in Northumberland, as figure13 shows (Figure 13 PHE 2014 (c)).

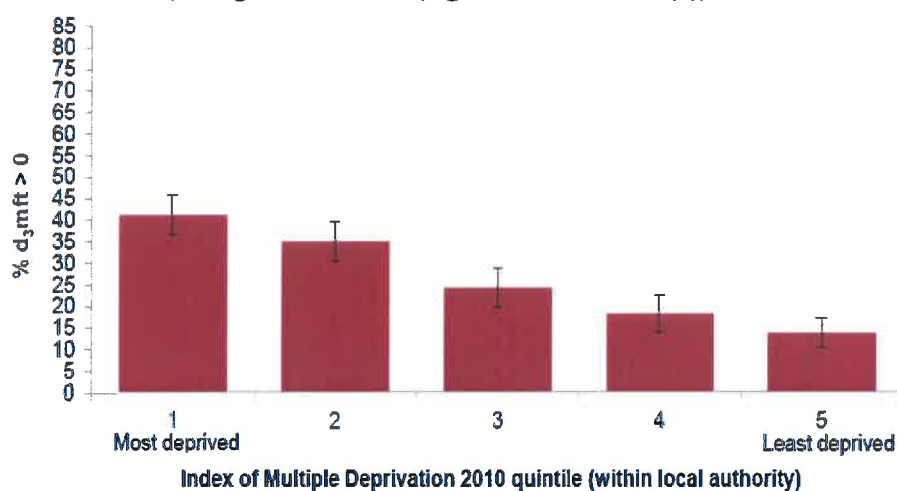


Figure 7: Prevalence of caries by Index of Multiple Deprivation 2010 quintiles for Northumberland (including 95% confidence limits shown as black bars). Taken from Northumberland Local authority Dental Health Profile of five-year old children (PHE 2014 (c))

Mapping the levels of dental decay on the map of Northumberland County Council Local Authority, highlights that higher levels of dental decay coincide with the areas of higher levels of deprivation (Figure 14, PHE 2014(c)). Mapping the areas of dental decay incidence can be useful in identifying areas that would benefit from more targeted interventions, but also it allows mapping of the service provisions and access to dental care to the areas of higher dental decay prevalence, to identify gaps in the current service provisions. The map (Figure14) highlights the areas with increased prevalence of dental decay in the North, at the border to Scotland, and further South in the coastal East of the county. Further information in relation to the variation of dental decay in 5 year olds can be found in the Appendix (Appendix 4) .

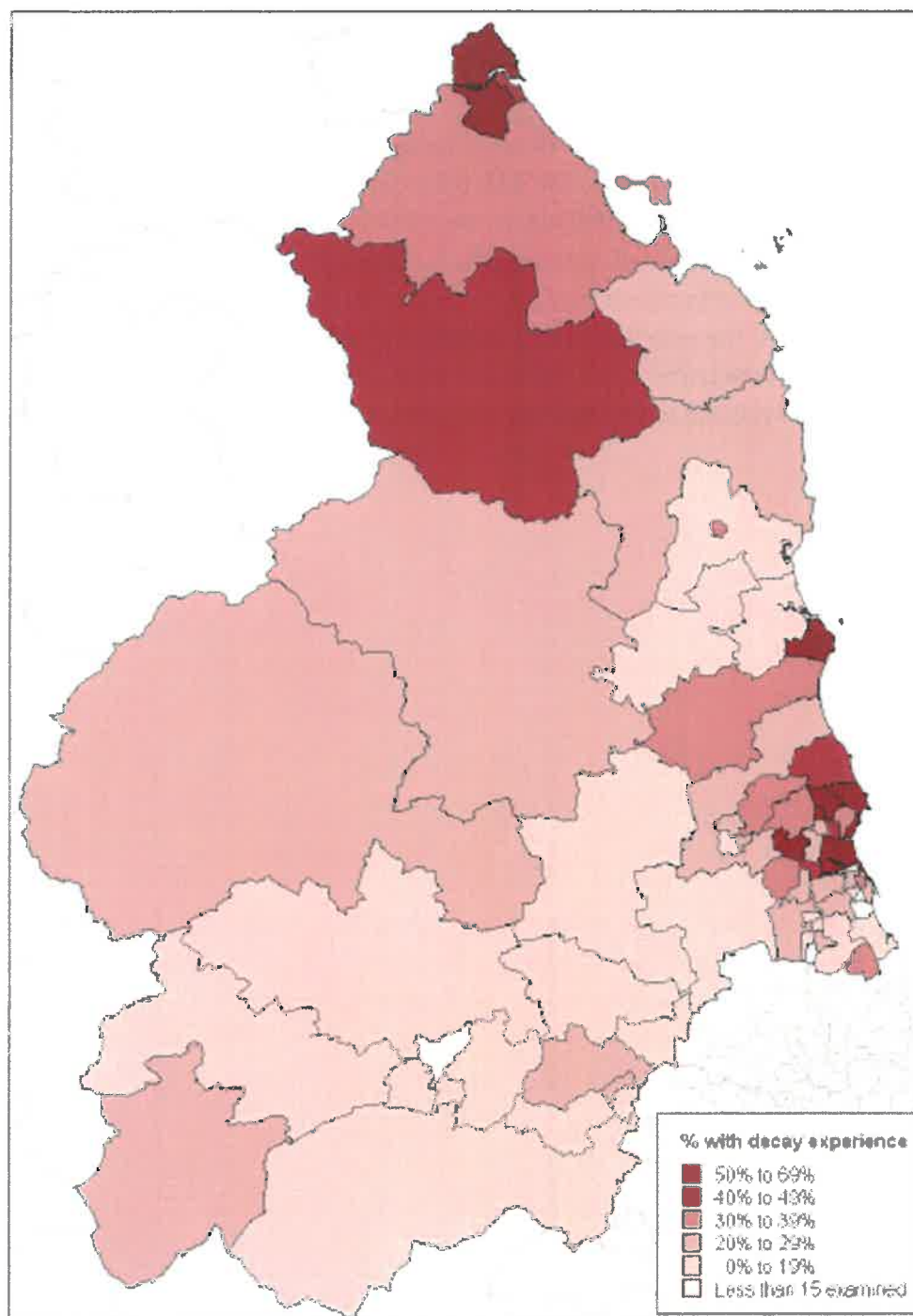


Figure 8 : Map showing decay prevalence by ward in Northumberland local authority (PHE 2014 (c)).

A further indicator presented by PHE as part of their Public Health Profiles is the rate of hospital admissions for dental caries among children aged 1-4 years of age. The rate of hospital admissions for dental caries in 1-4 year olds is significantly higher than the England average (322.0 per 100,000) for most of the North East, with the exception of Darlington (suppressed because of low count), County Durham (141.9 per 100,000), Hartlepool (151.0 per 100,000), Sunderland (162.7 per 100,000) and South Tyneside (269.8 per 100,000). Northumberland, with a rate of 518.9 per 100,000, has the 4th highest rate in the region, exceeded only by Redcar and Cleveland (536.7 per 100,000), Middlesbrough (570.3 per 100,000) and Newcastle upon Tyne (762.1 per 100,000).

A number of other factors beyond the presence of dental decay influence the rate of hospital admissions, and this will be further discussed in the section on dental extractions further on in this document.

Comparing the results from the 2014/2015 dental survey of 5 year olds, there has been a decrease in the prevalence of 5 year olds with dental decay experience ($d_{3mft} > 0$) in England overall compared with the results from previous years (table 5) . As mentioned before, data from surveys conducted prior to 2008 cannot be directly compared to those conducted after 2008 because of a change in the methodology (requirement of positive consent) and changes in the sampling across the country call for caution when comparing the results of the surveys on national level.

	2008/09	2011/2012	2014/2015	reduction in caries prevalence between 2012- 2015	reduction in prevalence 2008- 2015
England	30.90%	27.90%	24.70%	3.20%	
Northumberland	40.09%	27.60%	25.70%	1.90%	
East Riding of Yorkshire	17.70%	22.70%	23.10%	-0.40%	
Newcastle upon Tyne	53.10%	22.60%	22.50%	0.10%	
Hartlepool	33.80%	19.60%	15.40%	4.20%	
North Tyneside	34.80%	29.30%	18.30%	11.00%	
Middlesbrough	53.40%	41.50%	38.80%	2.70%	
Sunderland	43.30%	36.90%	40.00%	-3.10%	
County Durham	36.57%	27.20%	35.10%	-7.90%	
Darlington	39.60%	27.20%	35.40%	-8.20%	
Gateshead	35.20%	25.80%	23.80%	2.00%	
Redcar and Cleveland	39.80%	35.90%	27.10%	8.80%	
South Tyneside	36.60%	27.70%	26.00%	1.70%	
Stockton on Tees	43.90%	31.90%	25.30%	6.60%	

Table 5: Percentage of children with decay experience ($d_{3mft} > 0$) in the 2011/12 and 2014/15 national dental epidemiology survey of 5 year olds (data source: NHS Dental Epidemiology Programme for England, Oral Health Survey of 5 year old children 2007/08; 2011/12 & 2014/15))

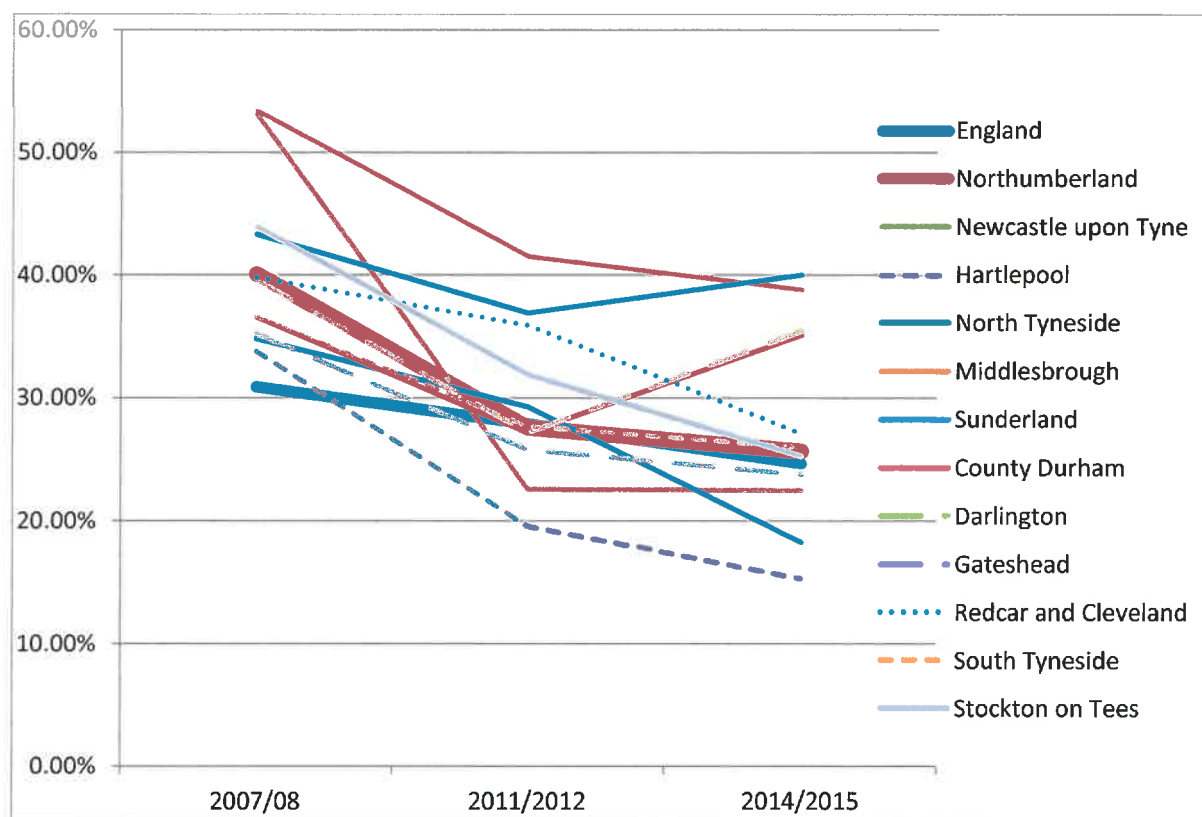


Figure 9: Trend of percentage of 5 year olds with obvious decay experience (% d3mft >5) in the 2011/12 and 2014/15 dental epidemiology survey (NHS Dental Epidemiology Programme for England, Oral Health Survey of 5 year old children 2007/08; 2011/12 & 2014/15)

The graph above (Figure 16) shows the trend of dental decay in 5 year olds in England and the North East from 2007/08 to 2014/15 using %d₃mft >0 as a measure and data from the national survey data (PHE data¹⁵) . The trend for East Riding of Yorkshire has also been presented in table 5, as the East Riding of Yorkshire is Northumberland's statistical neighbour.

Overall in England, an ongoing reduction in dental decay prevalence among 5 year olds has been observed. This positive trend is mirrored in Northumberland, but despite the reduction in caries prevalence among 5 year olds not having decreased as much as in England as a whole between 2011/12 to 2014/15 (a reduction of 1.9% in Northumberland compared to a reduction of 3.2% in England), the overall reduction since 2007/08 is greater in Northumberland than in England as a whole (6.2% reduction in England, 14.39% in Northumberland) the decrease is slightly less marked in Northumberland compared to England as a whole.

When looking at the trend overtime in other areas of the North East (and Northumberland's statistical neighbour, the East Ridings of Yorkshire) significant local variation becomes apparent. The majority of Local Authorities show a reduction in the prevalence of dental decay among 5 year olds, however, there are some areas that have a greater decrease than others, and some Local Authorities also have an increasing trend in dental decay, among their population.

¹⁵ available online: <http://www.nwph.net/dentalhealth/>

The reduction in dental decay prevalence observed in Northumberland has been just above average for the region. A number of local authorities have had a significantly higher reduction in their prevalence of dental decay. The greatest reduction in dental decay prevalence has been observed in Newcastle upon Tyne (a reduction of 30.6% between 2007/08 to 2014/15), followed by Stockton on Tees (18.6%), Hartlepool (18.4%) and North Tyneside (16.5%).

Lowest rates of dental decay are found in Hartlepool (15.4%) followed by North Tyneside (18.3%) and Newcastle upon Tyne (22.5%). The highest rates are in are found in Sunderland (40%) followed by Middlesbrough (38.8%) and County Durham (35.1%) (table 5).

The presented findings do not take into account levels of deprivation in the different Local Authorities. Assessing dental decay prevalence, adjusted for level of deprivation would provide useful additional information and would allow a better representation of differences in dental decay prevalence between the presented regions.

Of note is that Hartlepool benefits from naturally fluoridated water supplies that are of the level that is aimed to be achieved by schemes of artificial water fluoridation. The other areas with prevalence rates of dental decay under the national average (Newcastle upon Tyne and North Tyneside) both have water fluoridation schemes, serving all of their residents.

Dental health of 12 year olds

The results of the dental survey of 12 year olds conducted in 2008/09 (most recent survey for this age group) were derived from a sample of just under 10% of the population of 10 year olds in Northumberland, with 76.1% of the sample taking part in the examination (about 7% of the total population of 12 year olds in Northumberland)¹⁶. The survey found the overall prevalence of 12 year olds having experienced dental decay (measured by % D₃MFT >0) in 12 year olds to be significantly higher among children in Northumberland, compared to England as a whole. Just under half (45.3%) of all 12 year olds had experienced dental decay, compared to a third in England as a whole (33.4%). On a regional level, this is the third highest rate (after Middlesbrough and Darlington) of 12 year olds with dental decay experience. The epidemiological survey also measures the care index.¹⁷

The Care Index indicates the percentage of decayed teeth having been filled (FT/ D₃MFT); this is an indication of adequate treatment. A care index of 100% would indicate that all cavities have been appropriately filled. A low index would indicate that many 12 year olds have not received adequate treatment of their cavities. The care index in Northumberland measured in the survey was also significantly lower compared to that of England as a whole (32% compared to 47%). The care index is an indication of the levels of untreated disease, thus the results of the survey indicate a potential high level of unmet need among 12 year olds in Northumberland in relation to treatment of dental decay. Compared to other areas within the North East, this is among the lower levels of addressed need, en-par with Sunderland, and better than Darlington (29%) and North Tyneside (27%) only (only

¹⁶ Information from : <http://www.hscic.gov.uk/article/6181/More-than-a-third-of-12-year-olds-embarrassed-to-smile-because-of-their-teeth>

¹⁷ The care index is the proportion of teeth with caries experience which have been filled, derived by taking the number of filled teeth and dividing by the total number of dentinally decayed, missing and filled teeth and converting to a percentage (FT/D₃MFT)(Rooney 2010).

significantly different than North Tyneside, compared to the North East as a whole). Overall this indicates that the oral health of 12 year olds is significantly worse than the England average, with the care needs of this population also not being adequately addressed.

	examined	%D3MFT>0	Care index % (FT/D3MFT)
England	89,442	33.40%	47%
Northumberland	245	45.30%	32%
East Riding of Yorkshire	218	37.70%	50%
County Durham	297	41.90%	42%
Darlington	122	45.60%	29%
Gateshead	1,554	31.80%	47%
Hartlepool	247	30.80%	42%
Middlesbrough	201	47.80%	53%
Newcastle upon Tyne	713	38.00%	37%
North Tyneside	251	43.50%	27%
Redcar and Cleveland	185	43.00%	46%
South Tyneside	1,102	37.90%	57%
Stockton-on-Tees	298	44.10%	58%
Sunderland	2,064	43.00%	32%

Table 6: percentage of 12 year olds participating in the dental survey having obvious decay experience, including care index (Data source: NHS Dental Epidemiology Programme for England, Oral Health Survey of 12 year old children 2008/09).

Many interventions of addressing oral health needs of children focus on the early years (0-5 years) environment, and the focus on working with families through health visitors and children centres. The finding of the significant, unmet oral health needs among 12 year olds, highlight another important area that might not be sufficiently addressed through this approach.

The Health Related Behaviour Questionnaire (HRBQ) that has been conducted in secondary schools in Northumberland annually over the last 2 years shows a high level of understanding of health related behaviours and good health related practices. The result of the oral health survey is thus surprising. It is important to remember, that the oral health survey was conducted among 12 years olds in 2008/09, so in young people that would now be 20/21 years old. Thus the children participating in the HRBQ are a different cohort to those included in the epidemiological survey.

The findings from the dental health survey would suggest that just under a third of 12 year olds with dental decay, assessed at the survey, had been adequately treated. This would suggest, that despite the rate of 10-14 year olds accessing NHS dentists in Northumberland having been found to be above 80% (Landes 2013), that over two thirds of 12 year olds with dental decay, currently do not receive optimal treatment.

The findings of the comparative high level of dental disease and low level of care index appears to be at odds with the level of access to NHS dental care in this population. As the three findings (dental

disease in 12 year olds, health related behaviour in HRBQ and access to NHS care in this age group) relate to different cohorts of young people, it is difficult to triangulate these findings. A further exploration of the oral health in this age group would be of interest. At this stage the finding highlights the importance of ensuring that oral health needs in this age group warrant addressing further, for example through the school setting, to ensure this opportunity is not missed. As the impact of oral health in this age group impacts the permanent dentition and thus has a direct impact on lifelong dental health and dental health associated quality of life, it is important to address this as a priority.

Further information on considerations of the methodology of the dental health survey can be found in appendix 5 of this document (Appendix 5)

Use of levels of deprivation as proxy for dental decay among children

The link between Index of Multiple deprivation and caries prevalence in children aged 5 has been well established. A recent study in Sheffield, South Yorkshire (UK) found that the Index of Multiple Deprivation accounted for 60.4% of the variance in the distribution of dental decay among 5-year olds surveyed (Broomhead 2014). Nationally, in the most recent dental health survey of 5 year olds, 44% of the variation in decay levels in local authorities was explained by difference in the Index of Multiple Deprivation (PHE 2014 (d)). The index of Multiple Deprivation can thus be used as a proxy of higher rates of dental decay, in the absence of robust data on dental decay in local populations.

General Anaesthetic

Children experiencing severe dental disease often require dental extraction under sedation, or under general anaesthetic in the hospital. Dental extraction under general anaesthetic was the single most common cause for children aged 5-9 to be admitted to hospital in 2012-13(PHE 2014(e)). Aside from the associated clinical risk of a general anaesthetic or children and being a distressing experience for children and their families, it also leads to children potentially missing time off school, and parents having to take time off work, as well as having financial implications for the NHS. With a cost of extracting multiple teeth in children in hospitals in 2011-2012 of £673 per child, this equates to a cost of £23 million to the NHS in the same year (PHE 2014 (e)).

Based on data from the Commissioning Support Unit on episodes of care between the 1st of April 2013 and 31st of July 2015, the rate of general anaesthetic experience per 1000 population for extraction of decayed teeth across the North East Local Authorities was 14.16/1000 for 0-18 year olds.

Figure 17 shows the rate of general anaesthetic for dental extraction, with the highest rates found among children aged 5-9 year old.

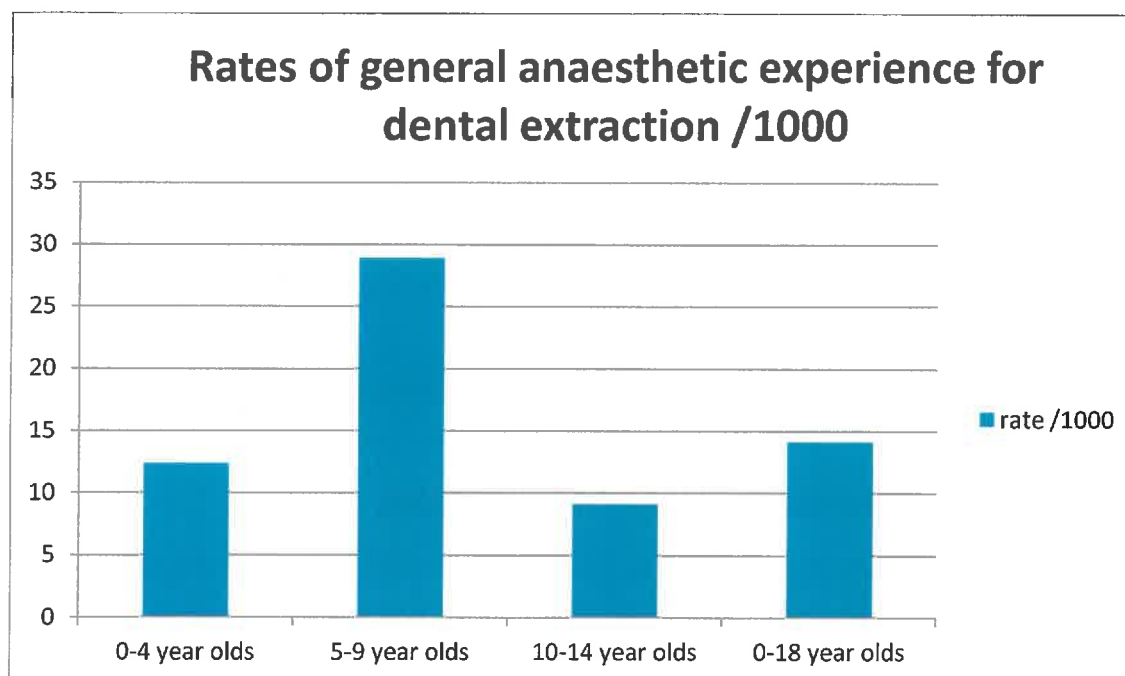


Figure 10: Rates of general anaesthetic experience for dental extraction per 1000 population (data from David Landes, unpublished report)

Applying the overall rate of 14.16/1000 to the mid-year population estimates of the 0-18 year old population in Northumberland in 2014 (64,079) leads to an estimated 907 patient episodes of dental extraction under general anaesthetic.

This is a substantial number of cases, and aside from the cost of the treatment itself, there is the cost to the wider society to consider: children missing school, parents having to take time off work to accompany their children, and the cost of the procedure itself.

At the 2011-12 costs, shown above, the costs of the presumed 907 patients in Northumberland, would equate to a cost of about £610,411 per year. In the current economic climate, with increasing scarcity of resources, decision makers should consider the opportunity costs of this spend.

Sedation for dental treatments

As pain management is an important element of dental care, the use of techniques such as behavioural management, the use of local analgesia, conscious sedation as well as general anaesthetic are an important element of dental care delivery, and the provisions of these interact (Douglas, Lewney 2015). A review of the evidence base of sedation in dental practice was conducted for the North East in 2015 (Douglas, Lewney 2015).

Evidence around the use of behavioural management, local anaesthetic, conscious sedation and general anaesthetic make it clear that these forms of pain management have their specific indications, and the choice of method used should be made, taking into consideration the healthcare history, psychological needs and overall management of a case (Douglas, Lewney 2015). The review concluded that appropriate use of advanced sedation may reduce the need for dental general anaesthesia. The review also concluded that there was a wide variation in the population experience around the use of sedation for dental treatment across the North East and Cumbria, which did not

seem to correlate with clinical need (Douglas, Lewney 2015). This is an interesting finding, and further work is likely to be required to explore this further and address inconsistencies, to ensure that all patients receive the optimal efficient treatment, ensuring their dental care experience is as pain free as possible, with the lowest possible risk to their health and wellbeing.

National Dental Health Survey Data for 3 year olds (2013)

The Public Health England (PHE) Dental Public Health Epidemiology Programme (DPHEP) conducted a survey of 3-year olds in the school year 2012-2013 (PHE2014 (d)). This survey relied on positive consent¹⁸, so some of the same limitations around the generated data apply, as for the dental health survey of 5 year olds, mentioned above.

In England overall, among the surveyed 3- year olds, 12% had experienced dental decay. The children that had decay on average had 3.07 teeth decayed, missing or filled. The average number of decayed, missing or filled teeth (d3mft) across the whole sample population was 0.36 (PHE 2014(d)).

In Northumberland 7% of the population of 3 year olds participated in the survey. Of the participating 3 year olds, 9.66% had dental decay (d3mft >0) (95% CI: 5.73-13.59%), and those children that did have decay experience, on average had 2.9 teeth affected. The average number of decayed, missing or filled teeth across the whole population was 0.28 (PHE 2014 (d)). These figures are comparable the figures of England as a whole, and puts Northumberland slightly below the national average for these measures in the survey.

Early Childhood Caries

This was the first survey conducted in this age group and it was also the first time data was collected on Early Childhood Caries (ECC)¹⁹. ECC is associated with long term use of bottles with sugar-sweetened beverages, and is a particularly aggressive form of decay (PHE 2014 (d)).

Prevalence of ECC in England overall was 4%, with a significant variation by area, with under 1% in some upper-tier local authority to up to 16% in the Borough Council with the highest prevalence (PHE 2014(d)). The rate of ECC in Northumberland was 4.6% (95% CI: 1.9-7.4%).

As Figure 18 shows, the prevalence of ECC from the dental survey across the North East was 3.5% (95% CI: 2.8-4.2%). With the lowest rates being 1.3% for both South Tyneside and Hartlepool (95% CI: 0.1-2.8%) and the highest rates in Middlesbrough (8. %/ 95% CI: 4.8-11.4).

¹⁸ Positive consent requires parents to explicitly give consent for their children to participate in the dental survey. This is a change from the previous negative consent arrangement, that required parents to opt-out of the survey, and consent was assumed if parents had not opted out.

¹⁹ Definition of Early Childhood Caries (ECC): "Caries affecting any surface of one or more upper primary incisors, regardless of the caries status of any other teeth." (taken from PHE 2014 (d))

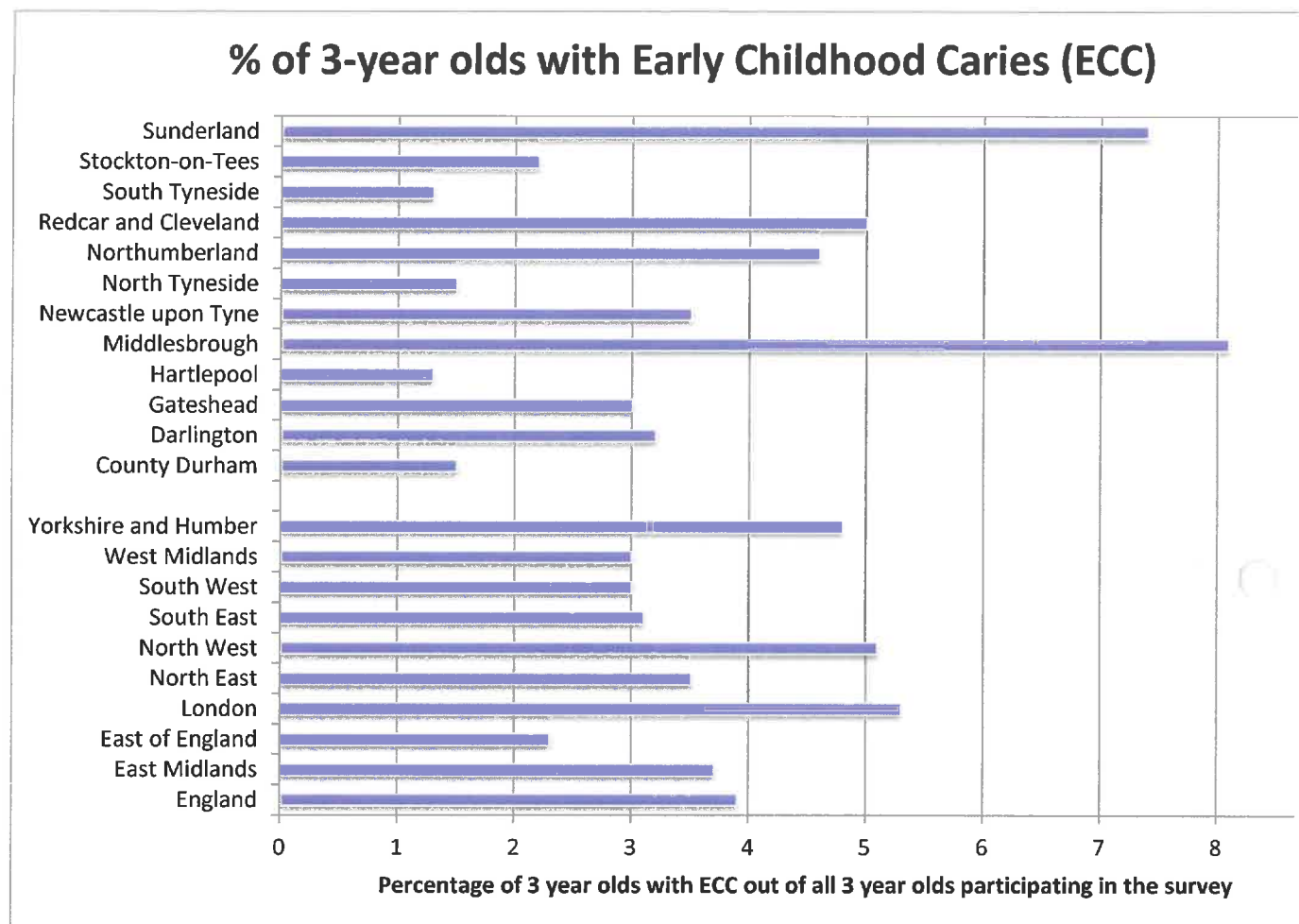


Figure 11: Percentage of 3-year old's, participating in 2012/2013 dental health survey, with ECC. (Data source: NHS Dental Epidemiology Programme for England, Oral Health Survey of 3 year old children 2012/13) / (PHE 2014 (d))

The 2014 report by PHE on the dental survey concludes that the data shows the high level of inequalities in relation to dental health in England, and that the causes of dental decay (high intake of sugar containing foodstuff and drinks, and low exposure to fluoride) need to be addressed to tackle this issue in particular among younger age groups (PHE 2014 (d)). ECC is known to be linked to the use of bottles with sugar-sweetened beverages for extended periods, especially if used overnight.

The levels of ECC found in Northumberland are higher than the national level. This indicates that targeted interventions aiming specifically at this problem of long term use of bottles with sugar containing beverages should be addressed. ECC is largely preventable, and interventions addressing specific aspects of infant feeding practices, like substituting beverages used in bottles with water or unsweetened milk and introducing free flow trainer cups and beakers instead of feeding bottles from about six months onwards could help tackle the problem (PHE 2014 f). Human Breast milk on its own is not cariogenic²⁰ and has the potential to aid deposition of calcium and phosphorus into enamel powder. However, in combination with other carbohydrates, breast milk and breastfeeding might increase the cariogenic properties of other carbohydrates (Ericksen 1999).

²⁰ Having the ability to produce or promote the development of dental decay

NICE guidance currently recommends exclusive breastfeeding for the first 6 months, and to continue breastfeeding thereafter, combined with the introduction of a more varied diet, for as long as mother and child wish (NICE 2008). In relation to oral health, NICE guidance makes clear recommendations to encourage parents and carers to use a bottle for expressed breast milk, infant formula or cooled boiled water only; to offer drinks in a non-valved, free flowing cup from age 6 months to 1 year; to discourage feeding from a bottle from 1 year onwards; to limit sugary foods to mealtimes only; to avoid giving biscuits or sweets as treats; to encourage snacks free of salt and added sugar (such as vegetables and fruit) between meals; to provide milk and water to drink between meals (diluted fruit juice can be provided with meals – 1 part juice to 10 parts water), as well as to discourage parents and carers from adding sugar or any solid food to bottle feeds and from adding sugar or honey to weaning (solid) foods (NICE 2008 (PH11)).

The oral health promotion team from Northumbria Healthcare Trust conduct parent and carer information sessions, as part of their oral health promotion offer. These sessions are aimed at new parents or parents of children at weaning age or toddlers. The oral health promotion team conducted a pre-session and post session questionnaire. The post –session questionnaire showed that nearly all (98%) of parents were able to give the correct response to the question asked to all questions, after attending the session. However, of interest were also the responses of participants prior to the session, with 26% stating that they thought the statement “ It is recommended that children should visit the dentist before the age of one year old?” was false (with an additional 20% stating they did not know if this was true or false). Only 40% of respondents were aware that children should be introduced to drinking from a cup from the age of 6 months onwards (29% stating this was not true, and 31% answering, they did not know). The knowledge about recommendation for weaning children off “dummies” was similar, with about a third (34%) of respondents (pre course) stating children should not be weaned off a dummy before the age of one year, and 42% agreeing to this statement (the remaining 24 % did not know whether this was true or false). These findings are a useful indication that further work to provide oral health information to parents might be beneficial.

Northumbria Healthcare’s oral health promotion team conducted a similar pre and post session survey with professionals working in Children Centres, nurseries and schools. The findings indicated the knowledge around oral health messages for children aged under 5 to be slightly better, than among parents , however, there was still a gap in knowledge evident just under half (47%) of respondents were aware that children should be weaned off a “dummy” before the age of one year and 27% thinking this was not true; and just over half (53%) of professionals knowing that it was recommended for children to visit the dentist before the age of one year and 22% thinking this statement was false. Only a third of professionals working with children under 5 years of age knowing that children from the age of 3 years could brush their teeth twice a day using a toothpaste containing 13500 ppm+ fluoride).

The finding from these pre-session questionnaire, highlight the importance for further work to raise the awareness of good oral health practices among parents, but also among professionals working with children and their families.

Recommendation:

It is recommended that this information is shared with community midwives, health-visitors, social care staff, and other staff working in early childcare settings, to help promotion of messages that aim to reduce the consumption of sugar containing drinks, as well as shorten the length of time that bottles are used for feeding infants. Clear and consistent messages need to be delivered in health education and health promotion work, aimed at families with young children.

Breastfeeding as has been well shown to have a range of positive benefits for infants, as well as their mothers. In the past there has been some debate as to whether breastfeeding has an impact on the likelihood of infants developing early childhood caries, or caries in general. A recent systematic review, including 63 papers, found that breastfeeding in infants until 12 months of age to reduce the risk of dental decay. However, if breastfed for longer than 12 months, children were at an increased risk of developing dental decay, especially if fed more frequently or nocturnally (Tham 2015). Cow's milk is linked to a lower risk of developing caries and has potential cariostatic²¹ properties (Ribeiro 2004). However, the nutritional quality of cow's milk is not sufficient to meet the needs of the growing infant under the age of 12 months, and is thus not recommended for consumption in children less than 12 months of age. Promoting breastfeeding until the age of 12 months, partnered with advice about feeding cup use and the avoidance of the use of sugar sweetened beverages and juices can help reduce the risk of caries in children.

Breastfeeding rates across Northumberland have been fairly static between the years 2009-2015 with 36.5% of mothers still breastfeeding at 6-8 weeks. This varies slightly by the different localities, with the West having the highest rates, and Blyth and Central having significantly lower rates. Interventions are ongoing to improve these rates. Initiation rates of breastfeeding are high, but there is a significant reduction in mothers' maintaining the breastfeeding status by day 10.

An action plan has been implemented to address this problem, and this is mainly aimed at increasing face to face support with HV and midwives, and offering a proactive supportive approach to women. A well-established network of volunteers supporting mothers to breastfeed has also been established, and is felt to have contributed to some positive trends in breastfeeding, especially in areas like Blyth and Central, that typically had lower rates.

The regional care bundle, aimed at increasing breast feeding rates, consists of

- Accreditation as "baby friendly" for all Surestart Children Centres, Hospitals and health visitors in the region.
- Every woman to have meaningful conversation about breastfeeding
- More pro-active face-to-face approach
- Use of social media (Facebook and Twitter) to promote breastfeeding, and support breastfeeding mothers.

Improving sustained breastfeeding rates might contribute to reducing ECC, by reducing the long term use of feeding bottles. Other elements to help improve children's oral health could be through staff training to ensure that consistent messages about weaning and infant feeding are communicated to

²¹ Cariostatic : preventing or inhibiting the progress of dental decay

families, and that the advice given is in keeping with NICE guidance and promoting good oral health. The family nurse partnership might play a useful role in promoting this, especially in young mothers.

Recommendation:

Northumberland County Council is encouraged to work together with health visitors, midwives, and other support staff, who work with mothers and their infants to support them in sustaining breastfeeding. Also provide support in ensuring messages to help promote good oral health are communicated to families early on, to help them establish good behaviours that can be maintained over the life-course.

Oral Health related behaviours

Health behaviour is defined as human activities protecting, promoting or maintaining the health of the individual (Petersen 2008). In order to obtain an understanding of oral health related behaviour in Northumberland a number of different sources of information were used in this oral health needs assessment.

The National Adult Dental Survey (ADHS)

The ADHS is a national dental survey that is carried out every 10 years, with the most recent one having taken place in 2009. The survey sampled 13,400 households across the UK (1,150 in each English Strategic Health Authority) between October 2009 and April 2010. This led to 11,380 adults being interviewed, and 6,469 dentate adults had a dental examination for the survey (Steele 2011). Detailed information of the methodology used in the survey can be found in the Foundation report (O'Sullivan 2011). The response rate in the North East was 61% of the 1,048 eligible households contacted. Across the North East, 992 adults were interviewed, and 568 adults had a dental examination performed as part of the survey (O'Sullivan 2011). Because of the sampling frame used, the survey allows an estimation of adult dental health and related behaviour on a regional footprint only, and not on county or local authority level.

The report showed a continued improvement in the dental health of adults in the UK. The national adult dental health survey 2009 (HSCIC 2011) showed 75% of adults reporting cleaning their teeth twice a day, and 23% reporting cleaning their teeth once a day (resulting in 98% of respondents reported cleaning their teeth daily.) The data is not presented at county level, thus not providing information specifically for Northumberland. As Northumberland tends to be similar to the national average for the majority of indicators, it can be assumed that findings here might be fairly similar.

There is also the question whether the reporting of tooth brushing practice is an accurate representation of actual tooth brushing by the population. Surveys and questionnaires are particularly prone to response bias²² and volunteer bias²³. By the nature of the survey, there is a chance of a bias to better oral hygiene practices by respondents consenting to participate in the survey, as well as a tendency of reporting of what might be deemed more socially acceptable

²² Response bias is a cognitive bias, as a result of respondents having the "desire" to please the studies, and give the "accepted response"

²³ A systematic difference in individuals volunteering to take part in the study, compared to those not taking part.

behaviours, or the “right” behaviours, over actual practices, leading to an over reporting of the frequency of tooth brushing..

The National Child Health (CDH) Survey

Like the ADHS, the CDH is also conducted every 10 years and commissioned by the Health and Social Carer Information Centre. The most recent survey was conducted in 2013. It allows a statistical estimation of the dental health of 5, 8, 12 and 15 year olds. Children’s experiences, perceptions and behaviours relating to their oral health were elicited through parent questionnaires, as well as self-completion questionnaires for 12 and 15 year olds. The sample frame over represents schools with a higher proportion of children eligible for free school meals, and thus results are only valid on a national footprint

Data on a national level shows the majority of 12 and 15 year olds to have good oral practices, in regards to attending their dentists for check-ups (above 80%) and more than three quarters reportedly brushing their teeth twice a day or more (HSCIC 2013). The previously mentioned impact of health inequalities on dental decay, also play a role in oral health related behaviour. A quarter of children from lower income families (identified through eligibility for free school meals) self-reportedly did not attend their GP for regular check-ups (10% more than for their higher income counterparts in 5 and 15 year olds) and there was also a higher proportion of children from lower income families, not brushing their teeth twice or more a day (28% compared to 18% in 15 year olds and 31% compared to 15% in 5 year olds) (HSCIC 2013). The percentage of children (aged 12 and 15 years) consuming sugary drinks four or more times a day was also doubled in children from lower income families (26% compared to 13% in 12 year olds and 26% compared to 12% in 15 year olds (HSCIC 2013).

Health Related Behaviour Questionnaire (HRBQ)

The Health Related Behaviour Questionnaire (HRBQ) is a survey that is conducted locally across secondary schools in Northumberland. In 2013/14 the HRBQ was first conducted in secondary schools in Northumberland as part of the health and lifestyle survey. The survey was repeated in 2014/2015. Two questions in this survey relate to oral health behaviours. Question 19: How often do you eat& drink the following (asks respondents to choose from a list including milk, fizzy drinks, energy drinks and sweets) and question 54: How long ago did you last visit the dentist?

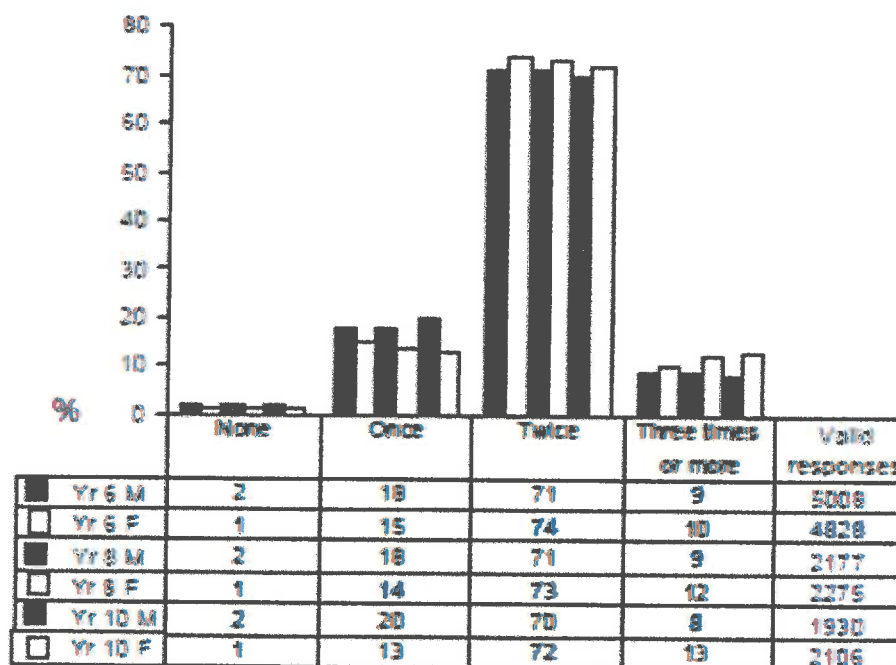


Figure 12: Responses from the 2013 HRBQ to the question : How many times did you clean your teeth yesterday? (Balding and Regis 2013)

In the 2013/14 the survey was completed by 1,760 pupils (880 female, and 880 males in year 8 (n= 976) and year 10 (n=785)). The results of the survey relating to Northumberland showed that 86% (89% in HRBQ 2015) of pupils filling in the questionnaire reported having visited their dentist in the preceding 6 months, with 61% (64% in 2015 survey) having visited in the preceding 3 months) (SHEU 2014).

In 2014/15 the survey was completed by 3521 students across Northumberland (females: 1831 (883 (Year 8), 948 (Year 10)); males: 1690 (795 (Year8), 895 (Year 10)). Attendance of dentist was higher in the 2014/15 survey, compared to the previous one, with 94% of young people responding to the survey stating having been to the dentist in the preceding year (89% having been in the past 6 months), and only 4% not having been to the dentist in more than a year (SHU 2016).

The 2013/2014 survey also assessed how often the respondents had brushed their teeth on the preceding day. This question was not assessed in the 2011/2015 survey.

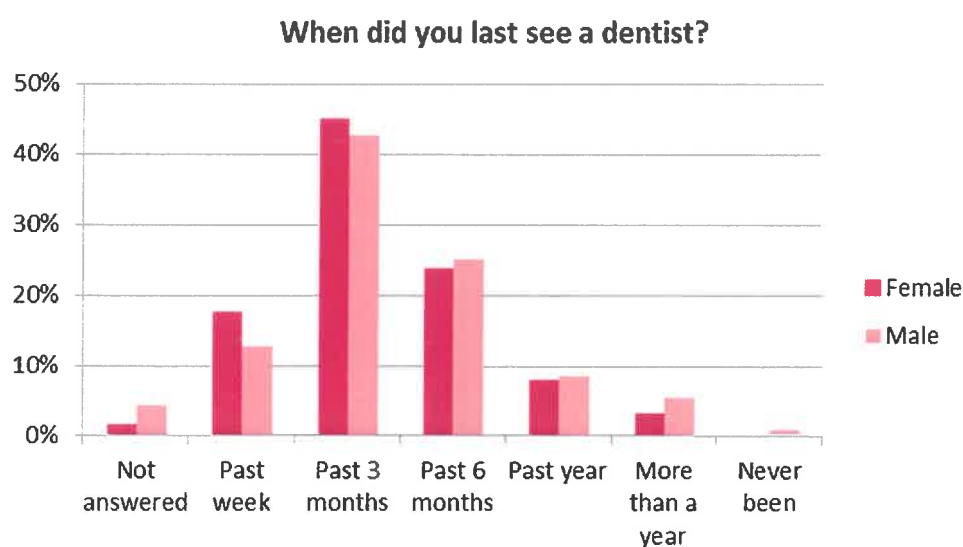


Figure 13: Answers to the question 'When did you last see a dentist?' in the Northumberland 2015 HRBQ

Costs

The cost of poor dental health on the NHS alone has been estimated as £3.58 billion a year on primary and secondary dental services (PHE 2014 (a) referring to NHS England 2014(a)). The full cost of NHS dental services in England in the financial year 2012/2013 was £3.58 billion, plus an additional £600 million in form of patient charges (PHE 2015 (c)). Expenditures of private dental services was estimated at £2.5 billion a year (PHE 2015 (c)), but information on private dental services is not as readily available as information on NHS services.

Following the Health and Social Care bill in 2012, public health responsibilities transferred to the local authorities in April 2013. Among a number of other areas related to public health, Northumberland County Council has therefore taken over the responsibilities for commissioning health promotion services and oral health improvement services.

Oral health Promotion services are the responsibility of the Local government, which has the oversight and commissioning responsibilities for these services.

Current spent by Northumberland County Council in relation to improving dental health of the residents is:

£74.00 for annual health promotion contract

£100.000 for water fluoridation

This leads to a total spent of £ 174,000 per annum, equating to a spent of just £0.55 per resident per year.

Responsibilities of funding dental services (primary, community and secondary care) fall on NHS England and CCG for oral surgery and the interface with maxillofacial surgery (Illingworth 2013).

Costs of primary dental care attendance are paid by NHS England with some part funding from patients not exempted from charged.

Criteria for exemption of dental charges are presented in table 7.

Exemption Type
Under 18 years of age
18+ in Further Education
Expectant Or nursing Mother
Full or partial Remission
Income Related Employment Support Allowance
Income Support
Job Seekers Allowance
Pension Guarantee Credit
Prisoner
Tax Credit

Table 7: The different criteria, excepting individuals from dental charges.

Therefore cost should not be a deterring factor for children and young people or those on income related benefits, as their dental care is free of charge. However, there will still be a group of residents that do not qualify for exemption of treatment, but for whom the co-payment charges are a barrier for attendance.

Patient dental charges contribute about 30% to the overall cost of the General Dental Service (King's Fund 2005). The costs of co-payments is divided into different treatment bands ranging from £19.70 for a band 1 course of treatment or emergency dental treatment (including diagnosis and treatment of temporary filling, scale and polish, fluoride varnish and fissure sealant) to £233.70 for a band 3 course treatment (including crowns, dentures, bridges and other laboratory work)^{24 25}

Between April 2012 and June 2014, just over half (55.6%) of all treatment episodes were taken up by charge paying patients (118,982 charge patients accounting for to 320,616 FP17s with an additional 251,430 FP17s relating to exempted patients) in Northumberland.

²⁴ Band 2 treatment : £ 53.90. covering fillings, root canal work, removal of teeth

²⁵ Charges taken from: NHS choices 2015 (available from <http://www.nhs.uk/NHSEngland/AboutNHSservices/dentists/Pages/nhs-dental-charges.aspx> date of last update: 26/01/2015. Date of review 26/01/2017).

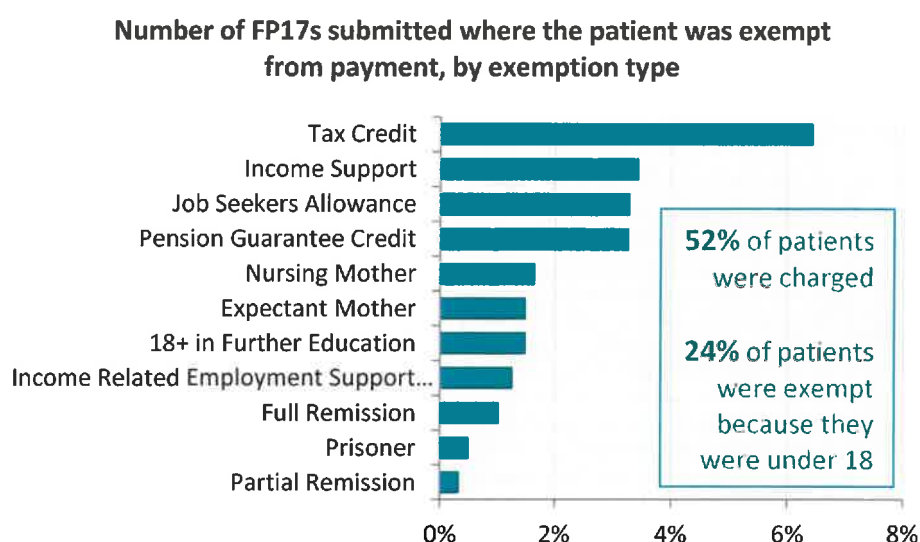


Figure 14: Percentage of FP 17s submitted by exemption type in Northumberland between April 2012 and June 2014

Costs for dental extractions

The cost of dental extractions under general anaesthetic under Healthcare Resource Groups (HRGs)²⁶ for Minor Extraction of Tooth 18 years and under is £434 and Extraction of Multiple teeth 18 years and under is £546 (David Landes unpublished). The cost of extracting multiple teeth in hospital in children in 2011/12 was £673 per child (PHE 2014(e)).

With a rate of 14.16/1000 population of general anaesthetic experience among 0-18 year olds, in the North East, this would amount to 907 patients with general anaesthetic experience, leading to a cost of £ 393,793 - £ 495,222 (based on PHE 2014 (e) estimate: £610,411) (assuming all single extraction – all multiple extractions), for Northumberland's population of 64,079 of 0-18 year olds (2014 mid-year estimate).

Dental health of adults

Data on the oral health of adults primarily derives from the national dental surveys, which have been conducted every decade since 1968.

The most recent national dental survey in England was conducted in 2009, with an overall sample size of 11,500 households, with a response rate of 59% (Office of National Statistics 2011). The survey found 94% of adults in England to be dentate, with just under a third of dentate adults having carious teeth.

On a regional footprint, the majority of adult population were found to retain their natural teeth, with only 8% of adults across the North East being categorized as edentate. 82% of adults in the North East had more than 21 natural teeth. However only 10% of adults met the criteria to be

²⁶ Healthcare Resource Groups (HRGs) are standard groupings of clinically similar treatments using common levels of healthcare resources and enable the comparison of activity within and between organisations to take place (from NHS digital: <http://content.digital.nhs.uk/hrg/>)

considered as being “with excellent oral health”²⁷. About a third (34%) of dentate adults in the North East have any carious teeth.

Periodontal disease is an umbrella term for conditions causing inflammation of the gums and a loss of the tissues supporting the teeth. Periodontal disease can often progress slowly and, though it can have a variety of symptoms, it is often painless. Untreated it can result in tooth loss. The national dental survey of adults found over half of dentate adults to have gingivitis (inflammation of the gums) with 45% of adults having pocketing of the gingiva (above 4 mm). It is more common in elder people. In the North East, the proportion of dentate adults with gum disease is slightly higher, than for England as a whole, with 61% of adults describing symptoms of bleeding, but with similar proportions of adults having pocketing of over 4mm (43%).

In England, 61% of dentate adults attend a dentist regularly, while 27% state they only attend a dentist when they have problems. Only 2% of adults in England state that they never see a dentist. In the North East, there is a very similar pattern, in dental attendance, with 65% stating they attend their dentist regularly, 25% only when they have problems, and 2% stating they never attend a dentist.

Oral cancer

Oral cancer is an umbrella term, including any cancer of the lip, tongue and rest of the oral cavity, but excludes cancers of the major salivary glands (BDA 2010)

Oral cancer is not very common in the UK, with the lifetime risk of developing oral cancer in the whole UK being 1.06% for men, and 0.48% for women (Warnakulasuriya 2009). Since the 1970s, the incidence rate of oral cancers has increased by 92% (Cancer research UK²⁸). The Incidence is directly proportionate to age, with 45% of new diagnosis annually being made in people aged over 65 years of age (Cancer Research UK²⁹). The lifetime prevalence for oral cancer in the UK is 1 in 75 (1.3%) for men, and 1 in 150 (0.6%) for women (Cancer research UK) Rates however have been found to be increasing in younger adults (under 45 years of age) (Warnakulasuriya 2009; Cancer Research UK³⁰). A parliamentary briefing paper, presented at the House of Commons in 2015 shows an increase of the age standardized incidence rate³¹ in oral cancers by 65% between 1995-2013 for both genders (Bate & Baker 2015). Cancer rates per 100,000 population are highest in the North West, and North East of England, and the incidence rates of cancer have been directly related with increasing levels of deprivation (Bate & Baker 2013). Survey conducted in 1999 suggested that only 50% of respondents

²⁷ Further information available from: Office for National Statistics. Social Survey Division, Information Centre for Health and Social Care. (2012). *Adult Dental Health Survey, 2009*. [data collection]. 2nd Edition. UK Data Service. SN: 6884, <http://dx.doi.org/10.5255/UKDA-SN-6884-2>

²⁸ <http://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/oral-cancer/incidence#heading-Two>

²⁹ <http://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/oral-cancer/incidence#heading-One>

³⁰ <http://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/oral-cancer/incidence#heading-Two>

³¹ Age standardized incidence rates, are the rates of new cases of a condition in a given time frame, that have been adjusted to remove age as a confounding factor, that is, taking into account differences in the age distribution of a population.

were aware of oral cancer (Warnakulasuriya 1999). In 2012, a further cross-sectional survey among 184 English-speaking adults in South East London showed the vast majority of patients having heard of oral cancer (73%) but 20% stated they had never heard of oral cancer, and 7% were unsure if they had heard of it or not (Awojobi 2012). 58% of respondents did not know or were not sure if their dentist checked for signs of cancer as part of their examination (Awojobi 2010). This finding is not representative of other patients elsewhere in the country, however it does suggest that oral cancer awareness needs to be increased, and dentists need to ensure they clearly communicate with patients in relation to this.

The main risk factors linked to the development of oral cancers, are the use of tobacco or exposure to the smoke, drinking alcohol as well as exposure to human papillomavirus (PHE 2014 f). Therefore the occurrence of oral cancer is closely linked to the distribution of these risk factors in the local communities.

A daily alcohol consumption of 25g/day or more has been associated with an increased risk of developing oral cavity cancer (Bagnardi 2001;Bagnardi 2015). This showed that consuming 25g/day of alcohol increased the risk of developing oral cavity cancer by 73%, consuming 50g/day of Alcohol nearly tripled the risk (pooled relative risk: 2.77) and consuming 100g of alcohol per day increased the risk by nearly 6 fold (pooled relative risk: 5.57) (Bagnardi 2001).

Increased incidence of oral cavity cancer along the social gradient can be clearly seen on a national level in the UK. The European Age-Standardised Incidence Rates by Deprivation Quintile vary from 3.1 in males in the least deprived quintile to 7.3 in males in the most deprived quintile. This trend is also seen in women, however the difference between the incidence rate between the least deprived and the most deprived do not vary as much (from 2.2 to 3.2) (Cancer Research UK³²). This is not surprising, given the association between increases in lifestyle related behaviours that increase the risk of oral cancers, with increasing levels of socio-economic deprivation.

Directly age-standardised registration rates of cancers per 100,000 populations of newly diagnosed cases of cancer, registered by May 2015 can be found in appendix 6 of this document (Appendix 6) .

Survival rates for mouth and oropharyngeal cancers have risen slightly over the last 20 years. Around 40 % of those diagnosed with oropharyngeal cancers, 90% of those diagnosed with Lip cancer and 50% of those diagnosed with oral cavity cancer will survive for 5 years or more following diagnosis³³.

Survival rates are also closely linked to the stage of the cancer at the time of diagnosis, with higher 5 year survival rates at the early stage (stage 0,1 and2) at diagnosis and lower survival linked to latest stage (stage 3 and 4) diagnosis³⁴. Some studies report potentially better survival rates in those with oropharyngeal or mouth cancer, who have human papilloma virus (HPV) infection.

As a result, the important aspect affecting the mortality from oral cancers is the time of diagnosis. Early detection increases survival rates. Regular check-ups from dentists, as well as advice to patients

³² http://www.cancerresearchuk.org/sites/default/files/cstream-node/dep_inc_bar_oralcavity.pdf

³³ Overall statistics for mouth and oropharyngeal cancers: <http://www.cancerresearchuk.org/about-cancer/type/mouth-cancer/treatment-and-outlook-for-mouth-cancers>

³⁴ <http://www.cancerresearchuk.org/about-cancer/type/mouth-cancer/treatment/statistics-and-outlook-for-mouth-cancers>

about self-examination are important aspects in secondary prevention, by ensuring cancerous lesions are detected early enough, and patients are referred to specialist services rapidly, following diagnosis, to improve treatment outcomes. Over recent years, the 3- year survival rates in oral cancer in England and Wales have improved (in men a 8% increase between 2004/06- 2008/10, and 4% in women (not statistically significant) in the same time period), with a clear indication that early diagnosis leads to improved 1 year as well as 3-year survival rates (table 9) (NCIN).

	Early stage at diagnosis	Late stage at diagnosis	Unknown stage
1-year survival rate male	92%	68%	79%
3-year survival rate male	81%	47%	62%
1-year survival rate female	94%	64%	81%
3-year survival rate female	82%	45%	65%

Table 8: 1- & 3- year survival rates for oral cancer in male and female between 2004- 2011 (NCIN)

Therefore, in order to reduce mortality from oral cancer, it is important to reduce risk factors among the population as well as increasing earlier diagnosis of oral cancer (BDA 2010) As shown by comparing the ratios of deaths (2007)/registrations (2006) of cancers of different sites, the ratio is highest among oral cancers with a ratio of 0.35 (the lowest ratio was found in skin cancers (melanoma) with 0.2 followed by breast cancer (0.26) and prostate cancer (0.28). The second highest ratio was that of cervical cancer (0.32) (BDA 2010). This aspect is highlighted through the low five year survival rate of oral cancers of only 48-55% of those diagnosed with oral cancer surviving for 5 years following diagnosis (BDA 2010).

The rates of oral cancer in Northumberland are similar to the national average, and the majority of areas in the region. In the whole North East Region, only Gateshead and South Tyneside have significantly higher rates of oral cancer than the national average, but as a result, the overall regional average is above the national average (Table 10, PHE data)

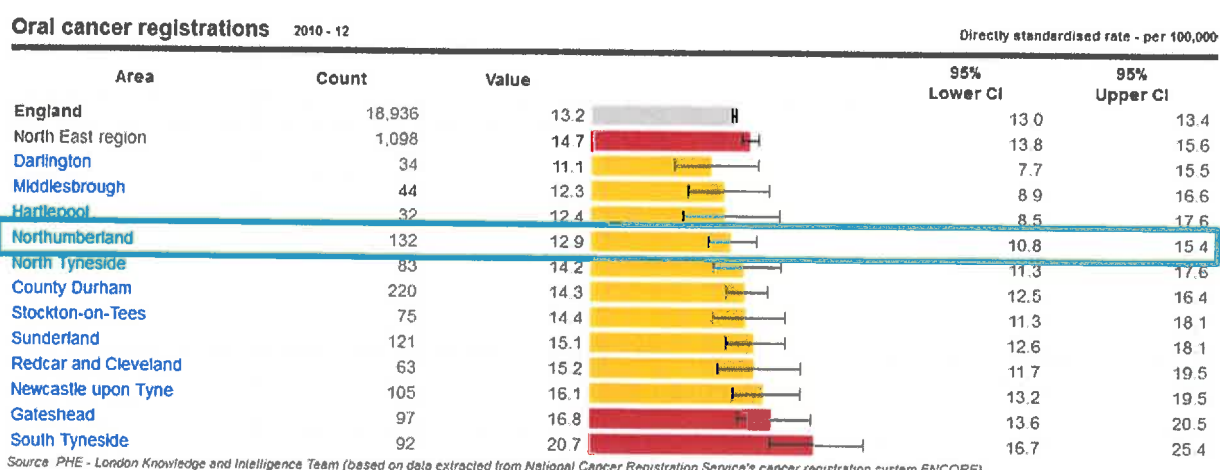


Table 9: Age standardised rates of oral cancer registration per 100,000 population (data from PHE: <http://fingertips.phe.org.uk/search/dental>)

In Northumberland, oral cancer was the primary diagnosis in 635 admissions in the preceding 3 years (April 2013- March 2016) (Data from NECS (North of England Commissioning Support)). The majority of admissions were Day cases (63 % (401 cases)) and just over a quarter of admission were elective admission (170) (73% of non-day care admissions were elective) with only about 1 in 10 admissions being non-elective (64; 27% of none-day case admissions) (data from NECS). The majority of hospital episodes were treated in Newcastle upon Tyne Hospitals, (97%; (n= 616) of all admissions), with just under 3% (18) of all hospital episodes having occurred in Northumbria Health Care. (There was one admission to City Hospital Sunderland). According to NHS reference costs in 2012-13, the cost of a day case was £693 , with the average cost of an elective inpatient stay (excluding excess bed days) was £3,366 and the average cost of non-elective inpatient short and long stay combined (excluding excess bed days) was £1,489 (Department of Health 2013).

Applying these costs to the admissions from 2013-2016 would results in a total cost of £ 945,409 (Day-case cost: £ 277893; elective admission cost: £ 572220; non-elective admission cost £ 95296). For 3 years. This is likely to be an underestimate of the cost relating to oral cancer in Northumberland, as the reference costs used are from 2012/13, and the costs are likely to have increased since then.

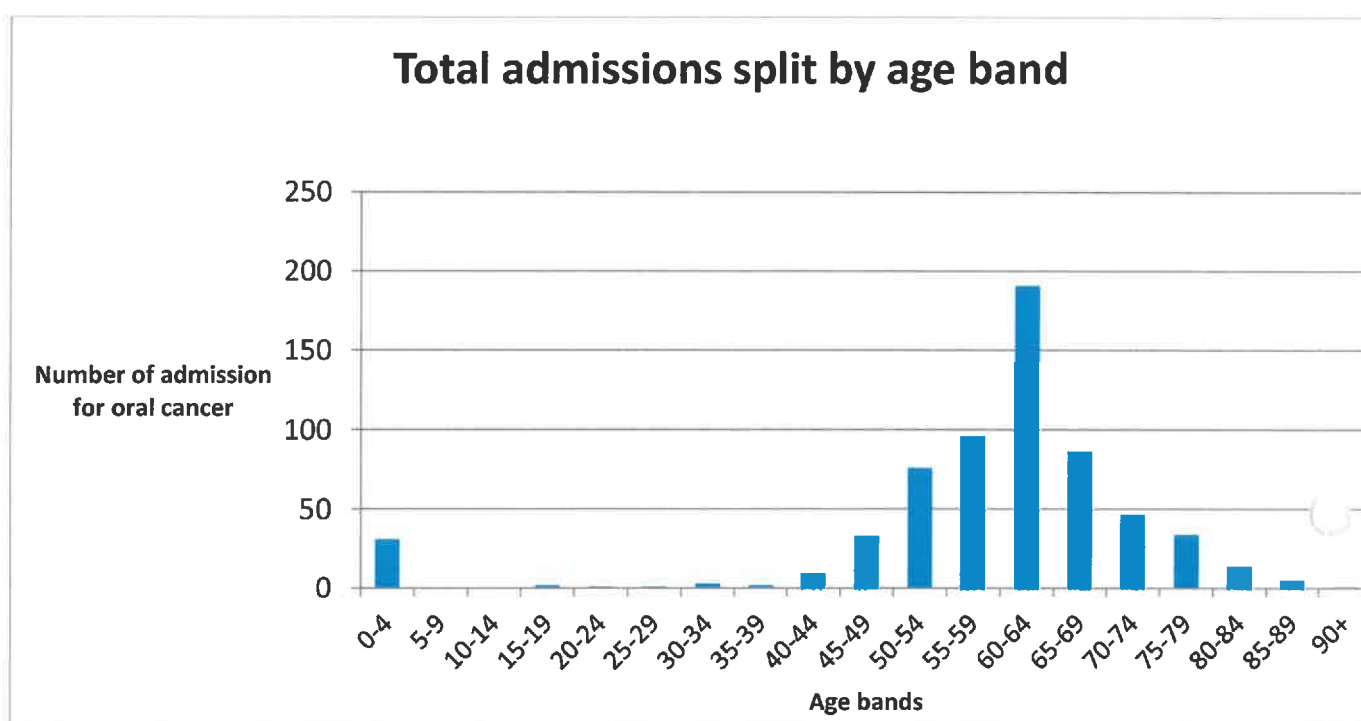


Figure 15: age distribution of oral cancer hospital admissions of Northumberland CCG residents. (April 2013- March 2016)
(Data source: Northumberland CCG)

Recommendations from the National Cancer Intelligence Network (NCIN) suggest that increasing awareness amongst the public, in relation to lifestyle risk factors associated with the development of oral cavity cancer as well as early signs and symptoms of the condition aiding earlier diagnosis, together with effective ways of targeting groups at risk of late presentation, as strategies to decrease the incidence of oral cancer, as well as improve the survival rates (NCIN).

Dentists play a key role in reducing the mortality of oral cancers both through a reduction of risk factors as well as in early detection and referral of suspicious lesions. In line with a common risk factor approach, many of the established risk factors for oral Cancer prevention are the same as those behaviours increasing the risk for oral cancer are the same as for other cancers or chronic conditions (see table 11).

Established Risk factors of oral cancer
Smoking and smokeless tobacco- cigarettes, cigars, pipes; chewing tobacco, oral snuff etc
Chewing betel quid/pan/gutkha/pan containing areca nut
High alcohol consumption
Presence of potentially malignant oral disorders
Prior history of oral cavity or aerodigestive tract cancer
Excessive exposure to sunlight and radiation (lip cancer)
Age (in conjunction with the other risk factors)
Possible risk factors
Diet lacking in fresh fruits and vegetables
Viral infection (certain types of human papillomaviruses (HPs) particularly for oropharyngeal cancers)
Immune deficiency disease or immune suppression
Mate drinking (particularly as a hot beverage)
Chronic sepsis in the mouth (especially in those with major risk factors)

Table 10: Risk factors for oral cancer and pre-cancer, presented in BDA 2010.

Dentists thus have an important role in oral health education and addressing risk factors among their patients. A potential to further explore is the ability of dental teams to carry out brief or very brief interventions aimed at reducing tobacco and alcohol consumption, as well as delivering health education to promote a healthy diet.

As oral cancer does not meet the requirement to be appropriate for a screening programme by the UK National Screening Committee, current advice is for dentists to conduct opportunistic screening of the patients attending their surgeries (BDA 2010).

Recommendation

To increase awareness of oral cancer and the risk factors associated with oral cancer among Northumberland residents, especially for those most at risk, smokers, those drinking more than 25g/day of alcohol and those at increased risk of exposure to human papillomavirus.

It is recommended that this is achieved, by working together with dentists and other professional groups working with individuals and communities most at risk.

Specific population groups

Elderly population

It is estimated that 11 million people living in the UK are over 65 years of age. It is predicted, that this figure will increase to 14 million by 2032 (PHE 2015 e). In 2015, there were an estimated 71,992 people aged 65 years and over living in Northumberland.

The oral health needs of older people have been highlighted as a particular challenge for the future because of the combination of the projected increase in the population of above 65 year olds by 3.2% by 2020, people retaining their natural teeth for longer as well as people living with complex care needs (BDA 2003). The importance of good oral health for the overall health of the ageing, has been well established (PHE 2015(e)). The 2009 national adult dental health survey found the percentage of dentate adults with excellent oral health to decline significantly with age, and whereas just under a quarter (23%) of 16-24 year olds are consider to have excellent oral health, above the age of 45-54 this reduces to just 5 %, and for those aged 55 years and above it reduces to 1% or less (Office of National Statistic 2012³⁵).

As expected, the number of adults with Natural teeth only, declines significantly with age; whereas over half (55%) of adults aged between 65-74 have only natural teeth, just under a third (29%) of those aged 75 and above have only got natural teeth, with 37% having a combination of natural teeth and dentures, and 33% being edentate with dentures only (Office of National Statistic 2012).

Having fillings and treatment for decayed teeth, leads to further problems and impacts later on in life, however the scale of the problem is difficult to predict, however costs for dental care are likely to be reduced, if adults have healthier teeth, and retain them for longer (Steele 2009)

A study conducted in County Durham, another county in the North East, characterised by a rural geography, explored barriers to accessing dental care by elderly people in rural settings (Devapal 2014). This research showed that cost and difficulties with travelling can be barriers to accessing dental care, especially for residents in rural settings. Encouragingly, as oral health related quality of life was rated highly, older people often found ways to overcome these difficulties.

An important consideration is that older people or more likely to be affected by other chronic conditions, as well as having a higher likelihood of being affected by oral health related conditions (like periodontitis, caries, tooth loss, oral cancer etc.) and might also find it harder to maintain good oral hygiene practices because of issues with eyesight or impaired manual dexterity.

Older people residing in Care Homes

The majority of older people reside in their own homes, however there are also significant numbers living in residential homes or care homes. A review of surveys conducted in England showed the available information to be disproportionate to the population size; with the majority of information

³⁵ Available online: <http://digital.nhs.uk/pubs/dentalsurveyfullreport09>

being available for older people living in care homes, despite this being the minority of this age group (PHE 2015(e)). The review of surveys of older people showed residents in care home settings to have an increased likelihood of being edentulous and not having a functional dentition, as well as having a higher rate of caries, which often was not treated (PHE 2015 (e)).

In 2015 an evaluation of the oral health care needs of elderly people living in residential care homes in Durham was conducted (Ahmad 2015). Through a mixed method approach, the oral health care provisions and oral health related training of care homes in County Durham was assessed. The findings allowed a number of recommendations to be put forward for the Local Authority, Care Homes, NHS England, the multi –professional dental education, Health Education North East, CCGs as well as research. These recommendations show a strong emphasis on the importance of training for all those involved in services for the elderly in care homes at all different levels of service provisions. One of the key recommendations for Local Authorities was to introduce a minimum set of standards in the care home contracts, to ensure good quality client centred oral healthcare for the elderly in residential care (Ahmad 2015). This recommendation could also facilitate the engagement of care homes with health promotion activities commissioned by the local authority, and help bring these services closer together.

Situation in Northumberland

In Northumberland there are 75 care/ residential homes, providing beds for currently 3000 residents³⁶. Three further homes are expected to open in the near future, creating a potential of 250 further beds across the county. As homes in Northumberland are currently not working to their full capacity, the number of home residents is not expected to increase dramatically in the short run. All homes in Northumberland receive funding from Northumberland County Council. To address issues of safeguarding and quality improvement around different aspects of care, including oral health, quality standards that directly impact the funding received by the homes, were introduced in 2011³⁷. The Quality standards represent a scoring system that informs a system of banding, with a band 1 care home being of the highest quality, and a band 4 scoring lowest. According to the banding, the per patient funding received by the care home from the local authority varies between £ 470 per resident per month (band 4) to £4700 per resident per month (band 1). This was thus felt to be a strong incentive for care providers to comply with the standard, as it is directly linked to a financial reward. The quality standard is assessed by a team of care manager, contract officer, infection control and lay assessor on an annual basis, so that compliance with this standard is monitored. There are currently 8 quality standards in total, with one relating to oral health assessment of resident⁴.

With changes to services, and the emphasis of providing services and care that allows people to stay in their own home for as long as possible, have meant, that people coming into residential or care

³⁶ February 2016 /information unpublished from conversation with Marshal Sisterson

³⁷ From conversation with Marshal Sisterson, Operational manager (contracts) for Wellbeing and Community Health

homes, tend to be more frail than they used to be in the past on entry to the care system. The length of stay of residents in care or residential homes or residential is getting shorter³⁸.

The oral health promotion programme commissioned by Northumberland County Council from Northumbria Healthcare Trust, has one programme aimed in particular at older people residing in care homes. As part of the *Mouth Care We Care Award* scheme, training sessions for care home staff are organised. As part of the evaluation a pre- and post-session survey was conducted by the oral health promotion team. The pre-session questionnaire identified some gaps in the knowledge of care staff around the oral health of their resident (table 12).

Question	Response: True	Response: false	Response: Don't know
Poor oral health can increase the risk of aspiration pneumonia?	57%	6%	43%
Gums that bleed when brushed are the result of poor oral hygiene?	64%	39%	6%
Dentures should be removed at night time to allow the mouth tissues to rest?	85%	11%	5%
A red or white patch in the mouth could be an early sign of mouth cancer?	38%	11%	51%

Table 11: responses to the pre-session questionnaire of care home staff conducted by the oral health promotion team of Northumbria Health Care, in Northumberland

Other services currently commissioned by the local authority in relation adult care are services for adults with learning disabilities, adults with mental health conditions, day care, as well as home care. (PHE) Currently none of these services have aspects related to oral care in their contracts, or quality standards.

Recommendation:

Further work to increase the knowledge of care home staff around the oral health needs of their residents (both for routine care, as well as identifying and responding to emergencies) and to work together with care homes and other organisations, commissioning services for care home residents, to ensure continuing improvement in dental health and dental health practices of older people.

Older people living in their own homes

The majority of older people live in the household setting. With the government policy to encourage 'care in your home', many older people, with complex care needs will increasingly be cared for in a household setting (PHE 2015 (e)); however, there is less information available on their oral health needs. Access to dental services is likely to be a significant barrier for many older people living in a household setting, as a result of limited functionality, living with long-term conditions and difficulties around transport. The review of oral health of older people highlights the importance of holistic patient –centred services, with dental health being fully integrated into other service provisions

³⁸ From conversation with Marshal Sisterson, Operational manager (contracts) for Wellbeing and Community Health

addressing the needs of this population seen as key in addressing the oral health needs of older people (PHE 2015 (e)).

The Dental public health epidemiology programme is conducting a survey aiming to provide information on the oral health of adults aged 65 years or older with mild dependency (Oral Health Survey of Older People 2015-2016³⁹). The oral Health Promotion Team from Northumbria HealthCare Trust, alongside colleagues from Northumbria Dental Services will be participating in this. The results of this survey, consisting of a questionnaire alongside an oral health examination, will be helpful to influence decision making for oral healthcare of the elderly.

Recommendation

As the population of older people living in the household setting is likely to increase significantly in the near future, with the care needs of these individual becoming increasingly complex Northumberland County Council should address this as a priority.

In order to achieve this, an integration of dental services for older people within the wider health and social care landscape is needed. Partnership working with others, commissioning or providing services for older people within Northumberland needs to be strengthened. This will also help to ensure relevant considerations in relation to oral health are addressed in all services procured through Northumberland County Council.

Oral health related considerations should be standard of all service specifications of Northumberland County Council.

Children and adults with special needs

The Department of Health recognises that adult and children with disabilities represent a particular vulnerable group in relation to their oral health needs. It recommends local authorities to ensure specifically developed, targeted approach for this group (DoH 2007).

The national dental surveys of 5 year-olds that are conducted on a 4 yearly basis only address the oral health of children in mainstream schools. Therefore information about the oral health of children in special schools is missing from these surveys. In September 2015, a report was published by Public Health England, addressing this gap. The survey was conducted in the academic year 2013/2014 (PHE 2015). This national survey, the first of its kind, addressing the oral health of children (5 and 12 year olds) in schools with severe special education needs and disabilities (SEND) showed the severity and prevalence of dental decay to be slightly lower than that of their mainstream school counterparts, for both 5 year olds (22% compared to 27.9% (statistically significant)) and 12 year olds (29% compared to 31.6 %) (PHE 2015). However, children in special needs schools, that did have dental decay, had more teeth affected on average, than children in mainstream schools (5 year olds with dental decay in special needs school had an average of 3.9 primary teeth with obvious decay. 12 year olds had an average of 2.37 permanent teeth affected, if

³⁹ Further information available at:

http://www.nwph.net/dentalhealth/older_people/National%20Protocol%20Oral%20health%20of%20older%20people%202015_16.pdf

they had dental decay) (PHE 2015). As with other childhood dental surveys, this survey also required parental consent to be returned for children to be included into the survey, introducing the risk of sample bias⁴⁰.

In view of the small sample size in many counties, there was insufficient information in the survey to present the data for 5 year olds for every local authority and data is not available on a county or local authority level for Northumberland. However, rates in the North East overall appeared higher than the England average, but the small sample size resulted in large Confidence intervals, therefore increasing uncertainties around these estimates and not allowing for the determination of statistical significance between the different populations (PHE 2015).

The sample size in the 12 year old populations were higher, therefore reducing the Confidence intervals in some areas, and allowing the identifications of some statistically significant results, between different geographical areas in England to appear (PHE 2015). For the average number of permanent surfaces affected by decay (decayed, missing or filled surfaces (D3MFS) per child in special schools was 1.52 in this age group, with the North East being the region with the highest , and statistically worse, rates at 2.45 (PHE 2015).

In Northumberland there are 11 special needs school, catering for children with varying levels of special needs. However the majority of children with special educational needs attend mainstream schools.

As part of the oral health promotion programme, commissioned by Northumberland County Council, there are work-streams, specifically addressing oral health in children with special needs, and those attending special needs schools (see section on Oral Health Promotion below).

It is important to note that children with dental decay attending special needs schools are more likely to require hospital admissions for treatment under GA for their dental extractions (PHE 2015). There are therefore wider implications, especially in this group of children, ensuring oral health is addressed, despite the potentially slightly lower levels of decay overall in this group.

In Northumberland this is recognised and one of the strands of the dental health promotion contract specifically addresses this area and is aimed at providing oral health promotion for children and their carers in special needs settings.

There are 12 settings that currently provide oral health promotion for parents and carers in the special needs setting for children and Young people, as well as for adults.

Settings delivering special needs oral health promotion

Children and Young People	Adults
The Grove	Helping Hands
Jospehine Butler Academy-The Centre	Pengarth Care Home

⁴⁰ Sample bias refers to a systematic error, as a result of individuals with certain characteristics being more likely to participate in the survey.

The Dales	Blyth Riverside Resource Centre
Cleaswell Hill	Dilston College
Collingwood Arts and Media College	Jane Percy House
Hexham Priory	
Barndale House	

Table 12: special care setting delivering oral health promotion as part of special needs oral health promotion programme from Northumbrian Healthcare

Oral health promotion training is also provided to professionals working in special needs settings, in a number of schools and adult education centres and the Dilston College for people aged 16-25 years old.

The pre-session knowledge around some relevant aspects of oral health was assessed, and a reasonable knowledge among session participants was identified (table 14). However, there was still a need for further information among a number of professionals attending the sessions.

Question	Proportion of responses: True	Proportion of responses: False	Proportion of responses: Don't know
To reduce the risk of tooth decay it is important to avoid sugar at bedtime and in the one hour before and during the night?	68%	20%	12%
Adults should brush teeth and gums twice a day using fluoride toothpaste containing 1350 ppm fluoride or above, spitting out excess and not rinsing with water?	70%	26%	4%
Poor oral health can increase the risk of aspiration pneumonia?	54%	4%	42%
A red or a white patch in the mouth could be an early sign of mouth cancer?	58%	13%	29%
For those at higher risk of developing tooth decay there are products containing higher levels of fluoride?	71%	8%	21%

Table 13: questions and proportions of the responses in the pre-session questionnaire for professionals working in special needs setting (oral health promotion team, Northumbrian Healthcare)

The oral health promotion conducted in special needs settings, has achieved positive outcomes; like the implementation of a tooth brushing scheme in The Josephine Butler Academy as well as other oral health promoting activities (dental resource box, oral health displays for parents, tooth brushing tips sheet for home and a school visit to the dentist, for children with anxiety).

People living with Long Term conditions

Diabetes mellitus

Diabetes increases the risk of periodontal disease (PHE 2014(f); Casanova 2014), which can be painful and also lead to tooth loss. The risk of periodontal disease is indirectly proportionate to glycaemic control, and HbA1c level (PHE 2014(f)). PHE gives advice on oral hygiene practices specifically for people with diabetes mellitus, as well as in relation to the impact of tobacco use and dietary factors impacting on oral health (PHE2014 (f)).

There is also emerging evidence suggesting a benefit of treatment of periodontal disease on patient's glycaemic control. A Cochrane review conducted in November 2015 found improved blood glucose levels by 0.29% for up to 4 months following scaling and root planning (Simpson et al. 2015). The review concluded that there was a need for further high quality studies in this area, but the review emphasised the two-way relationship between diabetes and periodontal disease that had been suggested by others (Casanova 2014).

Bowyer et al. conducted a survey among patients at 14 general practices in Warwickshire in 2011, and found the awareness of oral health care and oral health complications of diabetes to be low amongst the responding diabetic patients (Bowyer 2011). There is no data to assess neither the oral health status of diabetes patients in Northumberland, nor the awareness of the importance of oral health in particular in this patient group. This would be an area that would warrant further exploration in future.

The prevalence of Diabetes mellitus was estimated to be 8.1% of people > 16 years of age in Northumberland in 2015. However, if current trends persist, the prevalence is expected to increase, with an expected 9.6% of the population being affected by diabetes in 2030 (National Diabetes information centre:⁴¹

Recommendation

It is recommended to work together with dentists, as well as medical professionals caring for patients with Diabetes mellitus. The aim is to ensure that medical clinicians raise the importance of uptake of dental appointments, as well dentists addressing aspects in relation to Diabetic care with patients.

Cardiovascular disease

Periodontal disease has been epidemiologically linked to cardiovascular disease (CVD), and potential models of a causal link between periodontal disease and CVD have been developed. However further research is required to confirm this potential causation, and to confirm, if reducing periodontal disease reduces the incidence of heart disease (Demmer 2006) ⁴², or if the increase in periodontal disease in people with CVD is a confounding factor.

The oral health of people with cardiovascular disease has not been addressed in this oral health needs assessment, however, even in the absence of a clear causative link between poor oral health

⁴¹ (National cardiovascular intelligence network . Diabetes Prevalence model for local authorities in England)
http://www.yhpho.org.uk/diabetesprevaltable/pdfs/E06000048_Diabetes_Prevalence_profile.pdf

⁴² http://www.ada.org/~media/ADA/Member%20Center/Files/Perio_heart.pdf?la=en

and CVD, promoting oral health behaviours in those living with chronic conditions (like hypertension, CVD and diabetes) is likely to be beneficial and should thus be encouraged.

Alcohol

Alcohol consumption above the recommended limits has been shown to negatively affect oral health in a number of ways. As mentioned previously, increased alcohol consumption is clearly linked to increased risk of developing oral cancer, especially when excessive alcohol consumption is linked with tobacco use. However, Alcohol is also linked to an increased risk of dental trauma and facial injuries (through accidental falls, road traffic accidents and violence), increased rates of periodontal disease, as well as non-carious tooth surface loss , due to the acidity levels of some alcoholic beverages (PHE 2014 f).

It is important, that those working with individuals consuming high levels of alcohols, are aware of these risks, and can support individuals in reducing their alcohol intake, as well as encourage dentist attendance.

Prison Population

There is 1 prison in Northumberland (MP Northumberland in Morpeth), with an operational capacity of 1348 prisoners. The oral health of prisoner's in general tends to be worse, compared to that of the general population, with oral health having been identified as a well-known factor for health inequalities in this population. As the responsibility of funding all prison health services lies with NHS England⁴³, and not the local authority, the oral health needs of the prison population have not been addressed here. However, working together with NHS England in the future to address these needs might be beneficial both for NHS England, as well as for the local Authority, in using local services most effectively.

Oral Healthcare Services

Access to NHS Dental Services

The 2009 National Adult Dental Health Survey identified four main barriers to accessing NHS dental care. These barriers were: -ability to obtain an appointment; - cost; - anxiety; - relationship with the dentist. The sample size of the survey included 13,400 households, leading to 9,663 individuals in England being interviewed, and 5,622 dentate adults examined (HSCIC 2011).

The results are also shown broken down for the participating individuals in the North East. Figures for Northumberland are not available, but are likely to be similar to those for the whole of the North East.

The results from the national adult dental health survey:

Appointments:

Nationally, in 2009, just under three-fifths (58 %) of adults self-reported having tried to make a NHS dental appointment the preceding 3 years. Only 7% of these were unsuccessful in getting a NHS

⁴³ National Offender Management Service 2014 : Guidance:Health care for offenders. Available online through: <https://www.gov.uk/guidance/healthcare-for-offenders>

appointment. 87% of those being successful in obtaining an appointment already had an NHS dentist when they made an appointment, and 10% were able to make a first appointment.

Edentate adults were least likely to try to make a dental appointment (25% had tried); compared to 65% of patients with dentition and dentures, and 59% who were dentate only.

Self-reported dental health has little influence on patient trying to make appointment (52% of people with self-reported dental health that was bad or very bad had tried to make an appointment and 59% of people rating their dental health as good or very good.)

Inability of being able to make a dentist appointment was higher among younger adults (10% in adults 25-34 year olds) and 4% of patients being 65-74 year old, and 5% adults aged 75-84%.

Figures for the North East from the adult dental health survey:

64% had tried to make an appointment in the last 3 years (95 % were successful in making an appointment (with only 1% not attending the appointment); 5% were unsuccessful in making an appointment). 98% of North East respondents had a dentist that they made an appointment with, or were able to obtain an appointment at the first dentist they tried. Only 2 % of respondents had to visit or call two or more dentists to arrange an appointment.

Cost

26% of patients stated that the cost of treatment affected their choice of the type of treatment, and 19% delayed dental treatment out of cost reasons. Cost as a barrier to dental care seems to be a larger barrier for younger adults, with over 30% of adults aged 25-34, 35-44 and 45- 54 mentioning cost as a factor having influenced their treatment choice in the past, whereas fewer than 10% of adults aged 65 and over mentioned this. Women were more likely to delay treatment as a result of cost compared to men (20% vs 17%). Occupational class had little influence on the delay of treatment as a result of cost.

Interestingly, the self-rated quality of dental health had an impact on the likelihood of deferring dental treatment for cost related reasons, with 50% of those, rating their dental health as bad or very bad, compared to 37% reporting their dental health as fair and 20% who described their dental health as good or very good.

Figures for the North East from the adult dental survey:

17% of respondents for the North East from the national adult dental survey mentioned that their decision on treatment was affected by cost, and 14% stated that their treatment was delayed as a result of costs. For 10% their choice of treatment was affected as a result of the cost, and the treatment delayed.

Anxiety

Anxiety, as a barrier to dental care, has not been well explored previously, and the 2009 dental survey of adults is the first attempt, to capture this more detailed on a national level. The survey included a question in relation to fear associated with local anaesthetic, as well as an additional four scenarios, that the respondents were asked to rate the level of their anxiety on. The scoring ranged

from 5-25, with 5 indicating no anxiety, and a score above 19 indicating extreme dental anxiety and potential dental phobia.

The majority of patients who had ever attended a dentist had a dental score of 5-9. 36% of adults had a score of 10-18 indicating moderate anxiety, with 12% having a score of above 19, indicating extreme dental anxiety.

There is an age gradient in patients scoring 19 or over on the dental anxiety score (Figure 23).

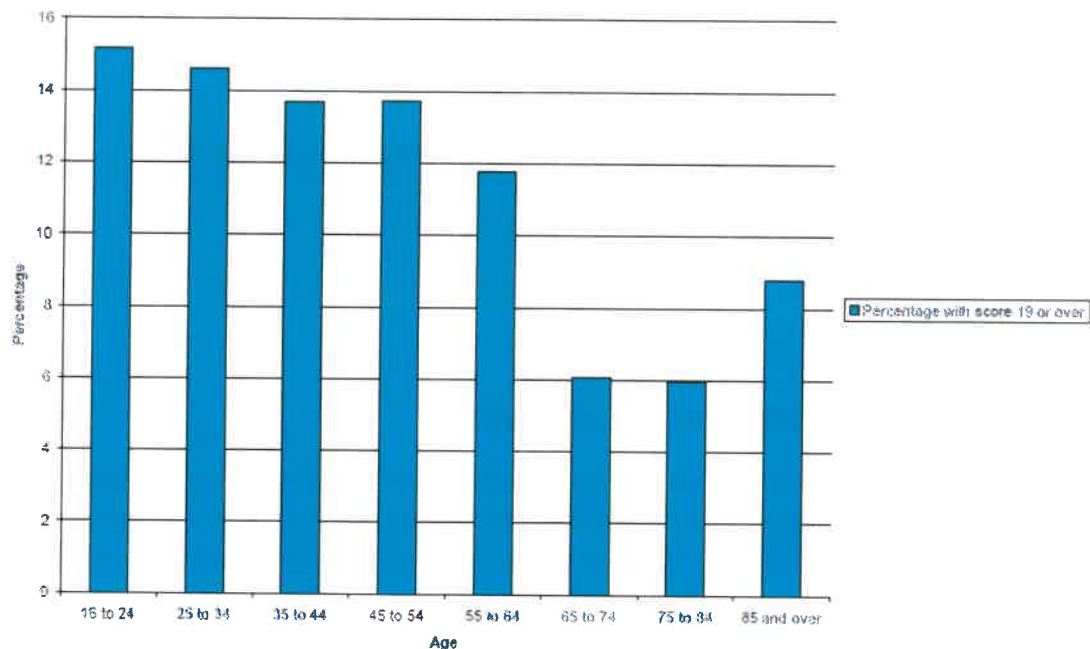


Figure 16: total MDAS scores by age (taken from HSCIC 2011)

There was also a pattern of respondents from lower socio-economic groups having higher rates of dental anxiety than those from higher socio-economic groups.

12% of adults who had ever been to a dentist had a Modified Dental Anxiety Scale (MDAS) of 19 or more, suggesting extreme dental anxiety.

Figures for the North East from the adult dental survey

52% of respondents in the North East had an anxiety score of 5-9, indicating no, or low dental anxiety, 36% had moderate dental anxiety (with a score of 10-18) and 12 % had a score of 19 or above, indicating severe dental anxiety. These levels are similar to those for England as a whole.

Relationship with dentist

80% of adults gave no negative feedback about their last dental appointment. One in five (20 %) consultations were reported as less than satisfactory for one reason or another (Figure 24).

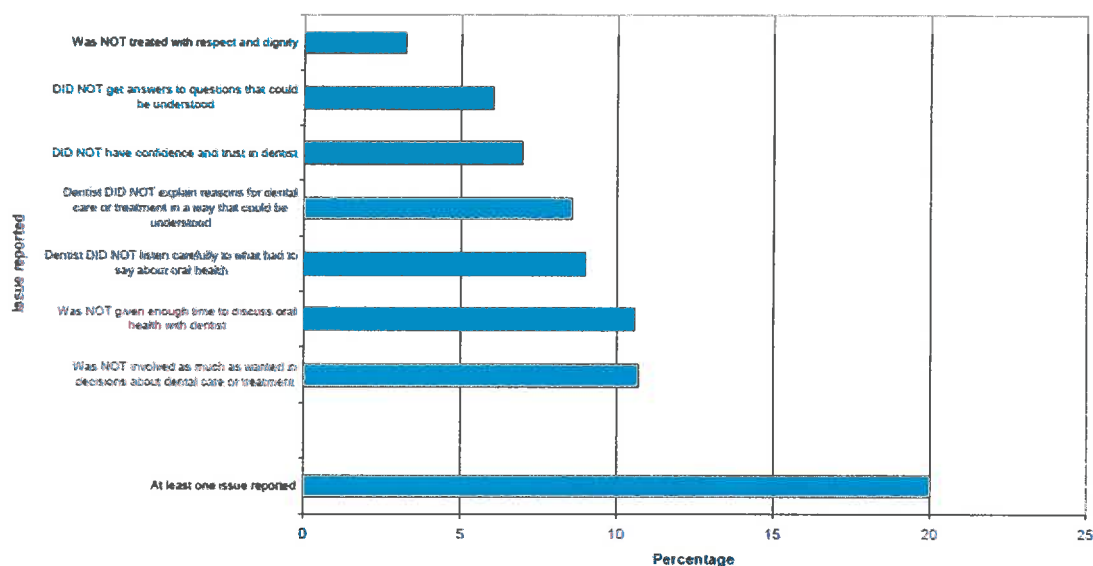


Figure 17 : negative issues reported in the relationship with the dentist at the last visit.(taken from HSCIC 2011)

Figures for the North East from the adult dental survey

In the North East, just under one in five (18%) respondents had at least one negative response, on their relationship with their dentist at the last visit. The highest rates of negative responses indicated that patients were not as involved in decision making about their treatment as much as they would have liked.

Further information for Northumberland

Some of this information could be obtained from the data collected from the Friends and Family Test and GP survey. Information relating to this is presented under the section "patient and community engagement" further on in this document.

Some of the barriers identified in the 2009 adult dental health survey were explored in the Northumberland Local population, as part of the population engagement process. The conducted survey as part of the patient engagement process was useful to get an indication of the transferability of the barriers on a national level to the Northumberland context. Dental anxiety, as a barrier to accessing dental care was not explored as part of the patient engagement.

For Northumberland, in view of the large percentage of individuals living in rural settings, and because of the vast geography, distance to dentists was also considered as a barrier to accessing NHS dental care in Northumberland.

Access to NHS dentists for the 15 month time frame from April 2013 to June 2014 was slightly higher in Northumberland (58.03%) compared to the England as a whole (55.79%). Access was higher

among children (68.86% in England and 69.07% in Northumberland) compared to adults (52.24% for England, 55.39% for Northumberland)(HSCIC 2014).

In 2013, David Landes conducted a report into access to NHS dental services for Northumberland, for the years 2012/2013 (Landes 2013). The data used to compile the report came from NHS dental practices, the salaried dental services and population data from the Office of National Statistics. The findings from the report are encouraging, and show good access to dental care for school age children (5-14 year olds) of Northumberland as a whole of 70%. Figure 25 shows the age and gender distribution of access to NHS dental care in Northumberland.

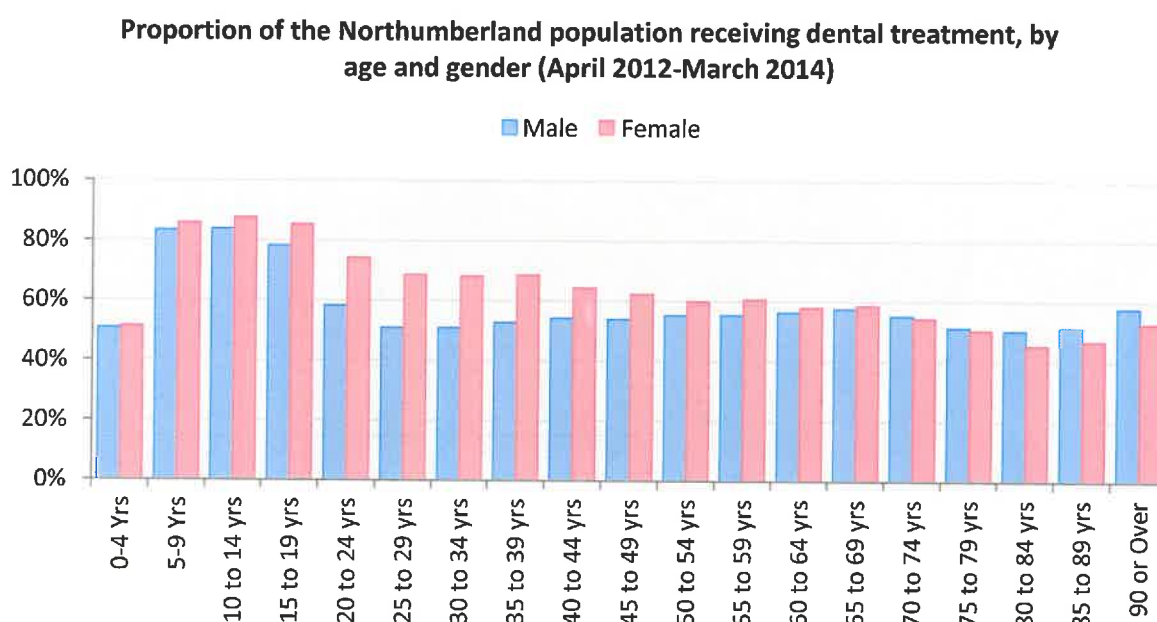


Figure 18: Proportion of population in Northumberland having NHS dental care 2012/2013 by age and sex (Landes 2013) (PHE dataset).

The above presented data only addresses access to NHS services and does not include private dental provisions, thus overall access to dental care could be higher, especially in specific age groups. However, private practices do not seem to play a significant part of the North East Health care economy (Landes 2013). A breakdown of percentage of the population with access to NHS services by ward shows variations in the overall rates. The two areas with the lowest rates of access are Amble (38%) and Wooler (39%) (Landes 2013), both of these wards were found to have higher rates of dental decay (percentage of children with experience of dental decay 50-66% and 40-49% respectively (Figure 15 above) on the dental epidemiological survey of 5 year olds. The areas with the highest rates of access are Hexham West (68% and Plessey 66%)(Landes 2013).Figure25 shows a map, produced by David Landes for his report , showing percentages of ward population with access to NHS services in 2012/2013(Landes 2013). This presentation is a useful start, in exploring issues around access to dental services, for the population in Northumberland, as well as the variation between rural and non-rural areas, and more affluent and more deprived populations. This will help the local authority and NHS England to further target interventions to increase access to NHS dental services.

It is however important to remember that there are potentially two reasons for rates of NHS dental service attendance being low; that is residents not accessing dental care, or residents attending private dental care.

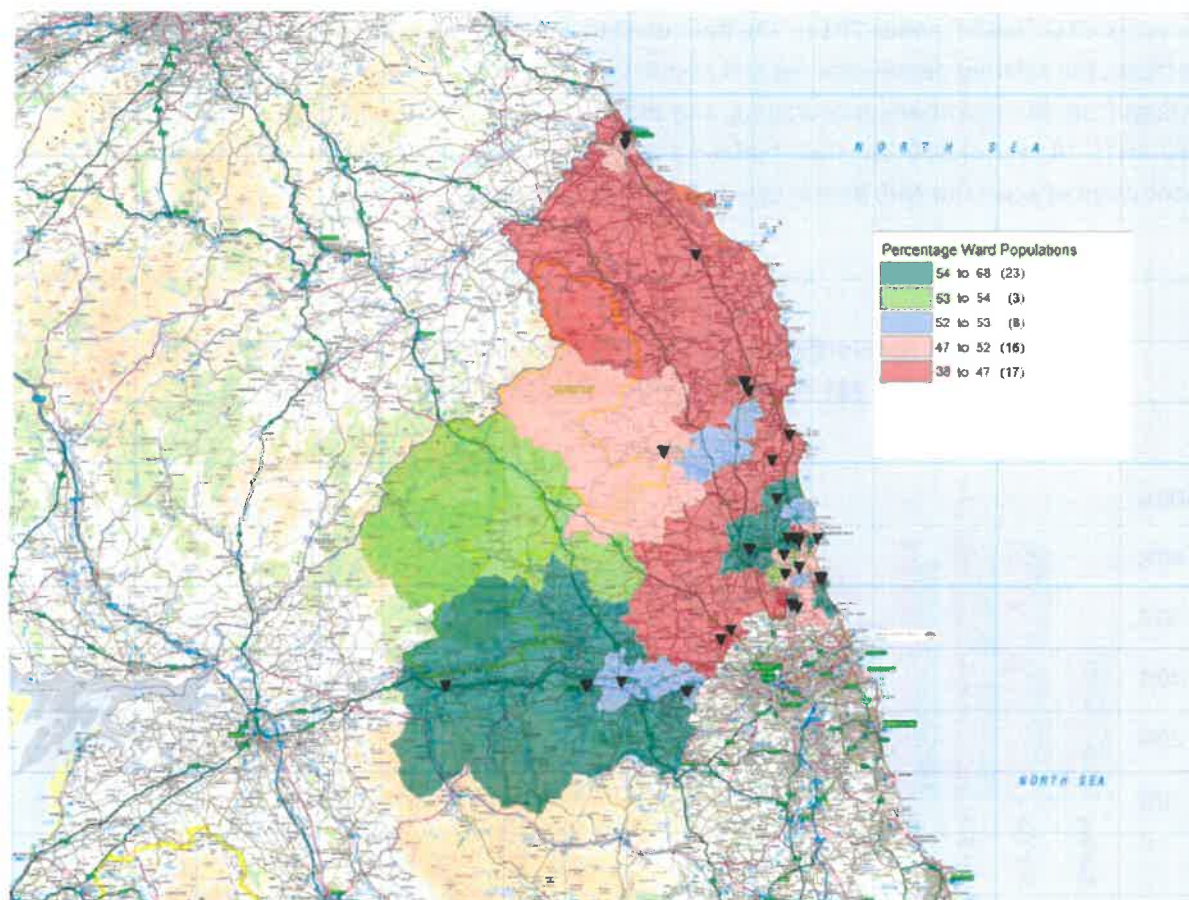


Figure 19: Map showing access to dental Services in the Local Authority Area (markers represent postcodes of contract holders, providing services in the Local Authority Area) (Landes 2013).

Another report conducted locally assessed distance travelled to access NHS services (Landes 2012). The report assessed the distance travelled by the 137,802 patients, who received routine dental care from NHS dental providers in Northumberland in 2010/11. Figure 27 shows the mean distance travelled by patients in order to access NHS dental care, in relation to quintiles of deprivation. In Northumberland as a whole, the majority of patients (just over 50%) travelled 3 miles or less to their NHS dentist for routine treatment. However just under 40 % of patients had to travel more than 5 miles, with 20% having to travel more than 10 miles to their treating NHS dentist (Landes 2012). These are average across the county, with variations between the rural and urban populations. Figure 28 shows the distances travelled, by Northumberland residents attending NHS dental services for routine dental care. Unsurprisingly, residents in Village Hamlets or rural areas travel longer distances (over four out of five (86%) residents have to travel further than 5 miles, and three quarters (74 %) have to travel further than 10 miles), than those in urban areas. However, 50% of NHS dental patients, living in towns and fringe areas, have to travel between 5 and 10 miles to access their treatment and about two thirds (67%) of all residents have to travel over 5 miles for their treatment.

The distance travelled reflects the remoteness of some of the areas in Northumberland, and it might not be feasible to provide NHS dental services in all remote areas, however, other ways of facilitating attendance for residents could be explored. This issue will be a key issue to explore with stakeholders (patients and providers) of dental services in Northumberland.

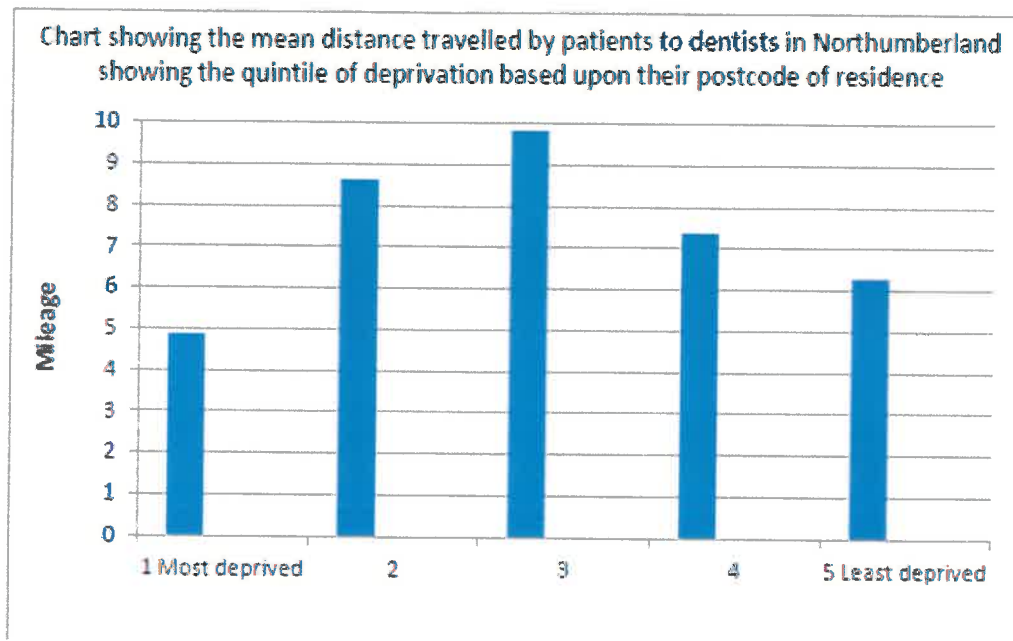
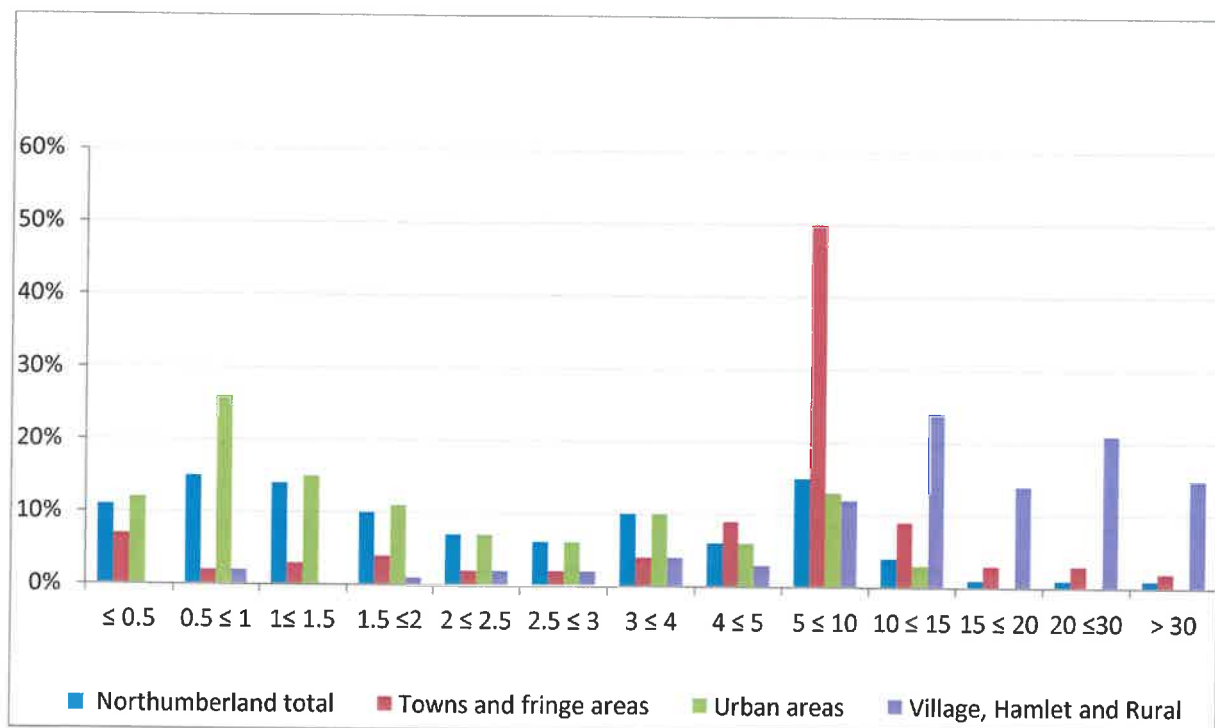


Figure 20: Chart showing mean distance travelled by patients to dentists in Northumberland showing the quintile of deprivation based upon postcode of residence (Landes 2012)



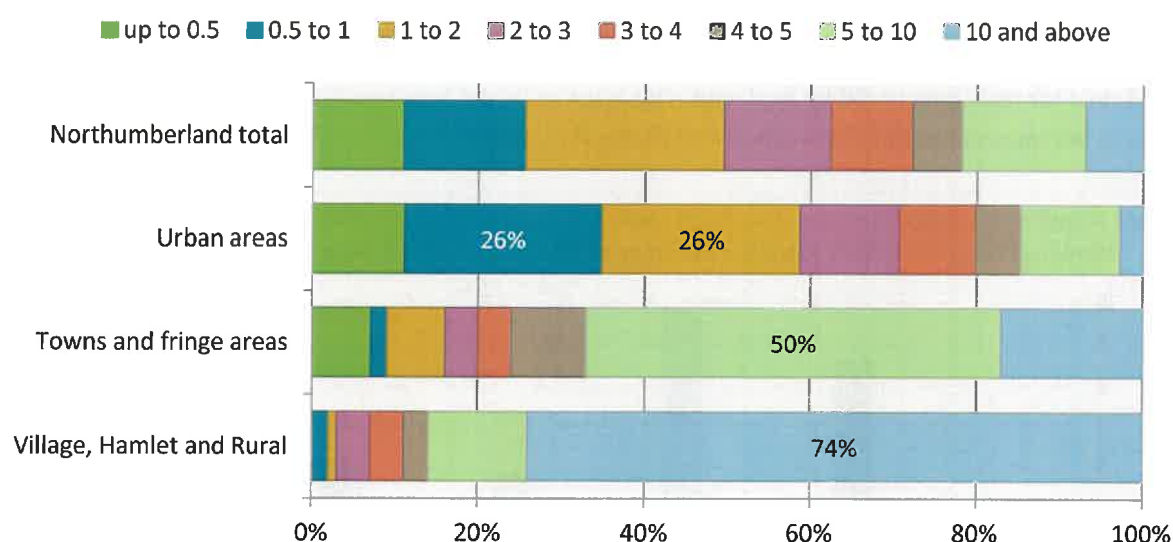


Figure 21: distance travelled by percentage of Northumberland Patients having attended NHS dentist for routine care by area of residence (table made with data from Landes 2012)

It is important to consider, that these are the distances that residents in Northumberland have overcome to access NHS dental care. There might be a number of residents for whom this distance was a barrier, preventing them from accessing NHS dental care. Also, some residents might chose a dentist, who is not the closest to their home but one which is convenient for them to access, which might be closer to their place of work for example. Therefore the distance might also be influenced by choice, rather than just by lack of closer alternatives.

Dental Health Services

The majority of dental health related patients contacts take place in general dental practices, either NHS or private practices. Community dental services nevertheless are an important element of dental services, by providing care for vulnerable groups and delivering dental public health programmes.

Some patients will require more complex or specialist care which is provided either by Northumbria Dental Services , in their community settings , or in Alnwick Infirmary ,Wansbeck or Hexham Hospital, or outside of the county, in neighbouring Newcastle or North Tyneside in the Newcastle Dental Hospital, the Great North Children Hospital or North Tyneside Hospital.

General dental practitioners

In Northumberland there are currently 38 sites from which NHS dentists are working. For this oral health needs assessment we included NHS dental services only, as obtaining robust data on private dental services is more challenging. Figure 29 shows the geographical distribution of general dental services across Northumberland, plotted against population density.

The Clinical Quality Commission (CQC) regulates dental services in England and inspects dental providers. CQC does not publish ratings on dental providers, but reports from their inspections of individual dental care providers are available online.

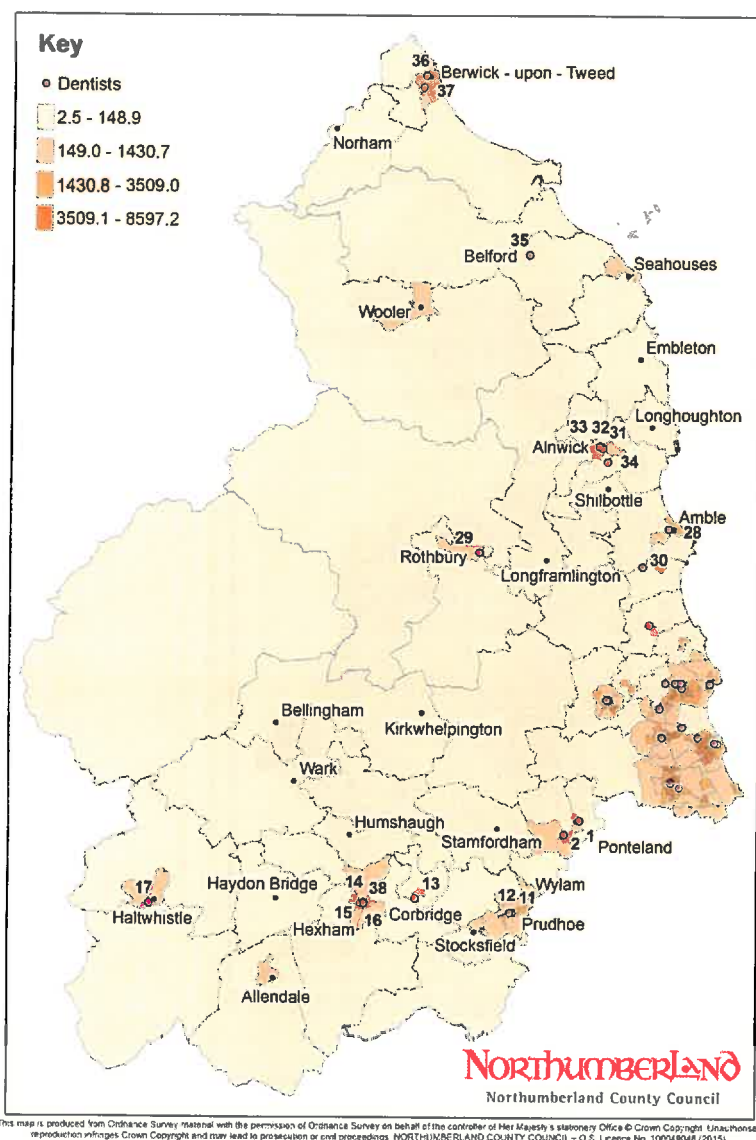


Figure 22: Locations of dental practices in Northumberland, mapped over population density in person per km^2 (source: SHAPE)

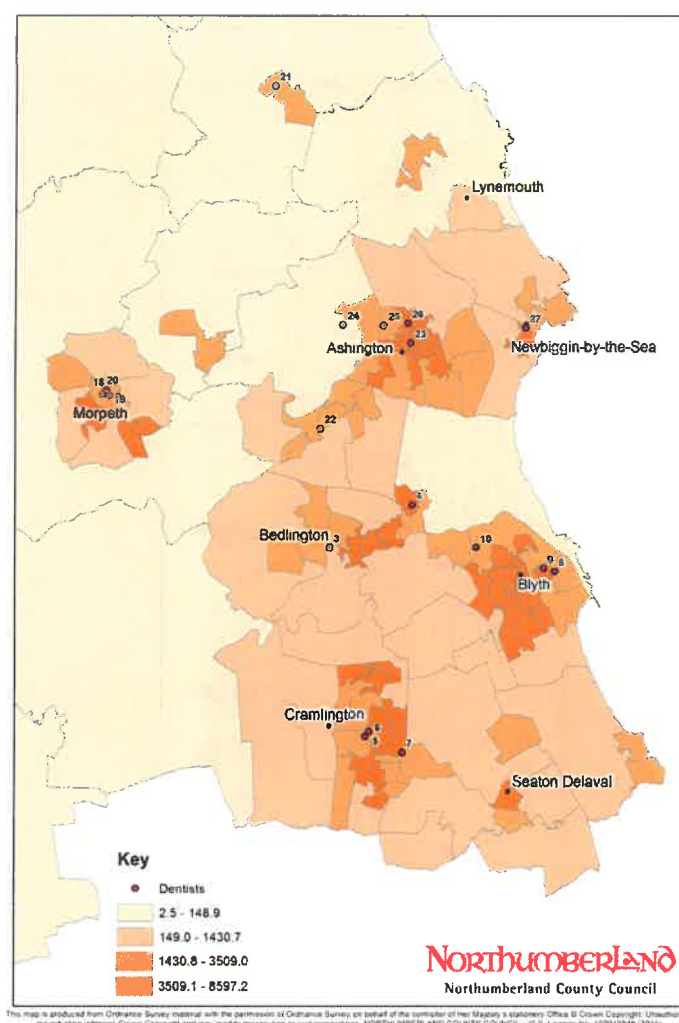


Figure 23: Locations of dental practices in South East Northumberland, mapped over population density (in person per km^2) (source: SHAPE)

From the available data, it is not possible to determine the number of patients having attended a NHS dentist for a routine check-up only. Treatment provided by dentists is grouped into 4 different bands, which are linked to a specific number of Units of Dental Activities (UDA), which is the contracting currency for dentists. A UDA equates to an average payment to dentists of £25.61 per UDA (BDA 2013).

The services provided by dentists under the different bands, and the attributed UDAs are listed below:

In 2012/13 and 2013/14 across Northumberland, there were 1,216,892 UDA recorded for a total of 216,800 patients (PHE data). 161,744 adults received treatment, accounting for 1,007,274 UDAs, and 55,056 children accounting to 209,618 UDAs. At the above mentioned cost of £25.61 per UDA, this would amount to a total cost of £ 31,164,604.12 by NHS England to dental providers in Northumberland over the 24 months from 2012-2014. Or an average annual cost of: £ 15,582,302.06 in Northumberland.

	Total number of patients treated	Total UDA	Band1 Activity FP17s	Band 1 activity Number of Patients	Band 2 Activity FPs	Band 2 activity Number of Patients	Band 3 Activity FPs	Band 3 activity Number of Patients	Urgent Activity FP17s	Urgent Activity Number of Patients
adult	161,744	1,007,274	228,347	115,078	129,693	82,122	27,451	23,218	44,520	33,34
children	55,056	209,618	95,265	46,511	31,778	20,153	949	826	6,121	4,964
total	216,800	1,216,892	323,612	161,589	161,471	102,275	28,400	24,044	50,641	38,30

Table 14: Numbers of patients treated as well as Units of dental activity and different bands of treatment for 2012/13 and 2013/14 in Northumberland (Data source PHE data)

Information is available on the number of different bands of treatment received by NHS dental patients in Northumberland. This allows an estimation of the level of treatments received by patients in Northumberland; however this does not indicate the number of patients, having attended for a dental check-up. As shown in the table above, the total number of patients treated is also presented. It is possible to show the patients treated on ward level, however, these are unique patients treated per contract. This means that patients attending different dental surgeries are double counted. Therefore the number of patients treated in this dataset is an overestimate of the actual number of patients being treated (PHE dataset). A proxy marker that can be used is the number of treatment episodes per ward, however, it does not allow an understanding as to how many patients attended the treatment, and many patients, especially those with a dental health problems, are likely to require more than one course of treatment. Thus a high proportion of treatment episodes per 1000 population would not necessarily indicate good oral health status.

For patients aged less than 18, the majority of treatment episodes were a band 1 treatment only. The percentage of band 1 FP17 out of all FP17 in this age group per ward ranged from 61.17%-80.52%, with an average of 71.53%.

Community dental services

Northumberland County Council commissions their community dental Services through Northumbria Health Care NHS Foundation Trust. The main objectives of the service are to:

- Provide dental care for patients, who, because of disability have a need for specialised dental care with regard to facilities, equipment or expertise.
- Provide a specialist referral service for general dental practitioners, the hospital dental service, general medical practitioners and other health professionals, for patients as specified within this document below.
- Provide additional services: RA sedation (IV/GA Sedation are provided out-with this contract), orthodontics and domiciliary services, for patients as specified within this document below.
- Undertake targeted dental inspections of pupils (section 16CB of the Health and Social Care (Community Health Standards) Act 2006) and targeted adult screening, where agreed between the parties.

- Participate in British Association for Study of Community Dentistry (BASCD) NHS Dental Epidemiology Programme (NHS DEP) for England. This programme is commissioned to support the collection, analysis and dissemination of reliable and robust information on the oral health needs of local populations. BASCD set out the changing focus of the programme each year.

Dental care is provided from 6 locations in Northumberland by Northumbria NHS Trust.

These locations are:

- Amble Health Centre
- Blyth Health Centre
- Morpeth NHS Centre
- Seaton Park Medical Group (Ashington)
- Wansbeck Hospital
- Hexham Hospital

General anaesthetic provisions

Some dental procedures are carried out under general anaesthetic. Following guidance from the General Dental Council (GDC), as of 1st of January 2002, all general anaesthetics carried out for dental treatment needs to take place in a NHS Acute Trust (Douglas 2015). Intercollegiate Guidance advocates the use of general anaesthetics in the treatment for children under 12 years of age with complex oral health needs, or for those who cannot be managed with behavioural management techniques/ local analgesia or local analgesia plus inhalation sedation (Douglas 2015).

Tooth extraction is the leading cause of hospital admission in young children in the UK (SACN 2015 citing Elmer et al. 2014), and PHE have found 45% fewer hospital admissions among 1-4 year olds in areas receiving fluoridated water supplies (PHE 2014 (b)).

Children admitted for dental work under a general anaesthetic, generally require multiple dental extractions for dental decay. Single dental extractions would be carried out under sedation whenever possible, avoiding the need for a general anaesthetic. A general anaesthetic is often seen as a fairly routine procedure, but all general anaesthetics come with a potential risk to the individual's health, and this should be considered when making a decision as to performing a procedure under general anaesthetic.

In Northumberland children requiring admission for dental work under general anaesthetics would in general be treated by Northumbrian Healthcare NHS Foundation Trust at Wansbeck general hospitals, Alnwick Infirmary or North Tyneside Hospital. Some children receive treatment at Newcastle upon Tyne NHS Foundation Trust, at the dental hospital, or the Great North Children Hospital (RVI).

In the financial years 13/14 to 15/16 a total of 901 children from Northumberland were admitted to hospitals for dental extraction under General Anaesthetic. Out of these, just under two thirds (566) were treated by Northumbrian Healthcare NHS Foundation Trust, with the remaining third (335) children having been treated by Newcastle Foundation NHS Trust.

Age range of children admitted for dental extraction under GA ranged from 1 year – 18 years. The majority of children requiring a GA for dental extraction were between 5-9 years of age (479 /901 = 53.2%), followed by children under 5 years (195/901 = 21.6%) and then children between 10 and 14 years (151/901 = 16.8%). Only 8.3% of dental extractions under GA were carried out in children above 15 years of age (75/191) (Figure 31). The rate of general anaesthetics for 0-19 year old was 65 per 100,000 populations in Northumberland (Douglas 2015). In the whole of the North East and Cumbria, the rate of general anaesthetic for 0-19 year olds ranges from 12 per 10,000 population in Eden, to 95 per 10,000 population in Barrow-in-Furness (the average rate was about 43 per 10,000 population). The rate in Northumberland was the third highest, after Barrow-in-Furness (95) and Newcastle upon Tyne (69) and the same that in North Tyneside (65).

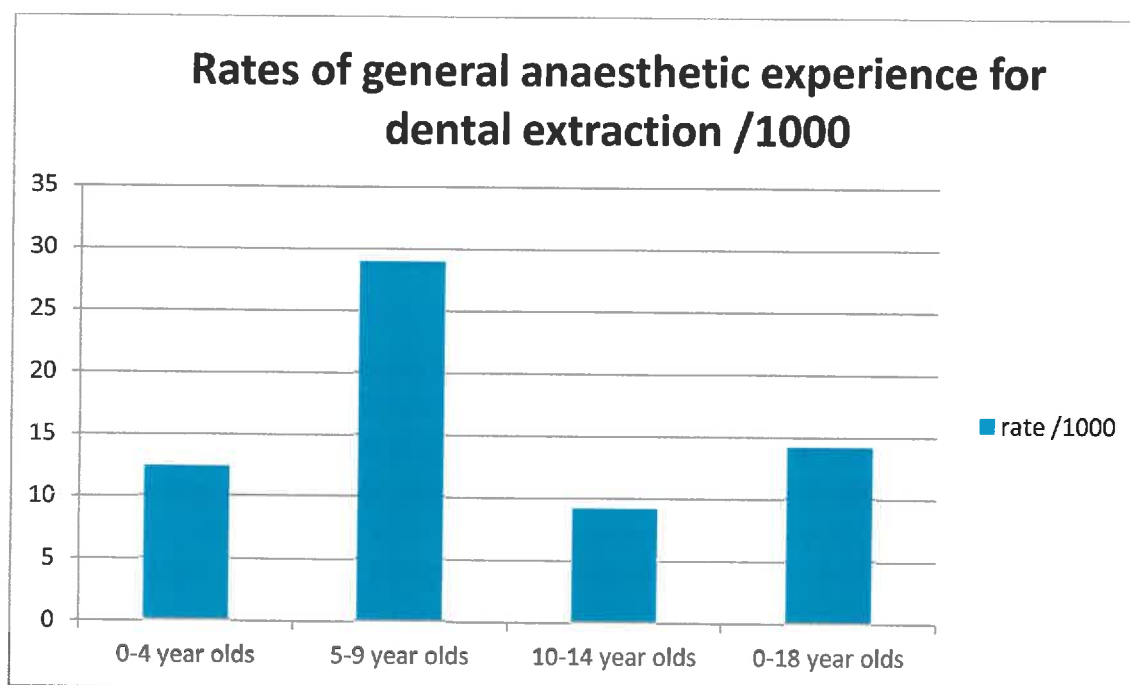


Figure 24: Showing the rates for general anaesthetic experience for dental extractions for the different age groups.

In the financial years 13/14 – 15/16 there were 906 dental extractions among children and young people (0-18 years) of Northumberland (annual average of 302). The cost of these treatment episodes equated to a total cost of £ 493.893.8 (or an annual cost average of £ 164.631.27).

Sedation

Conscious sedation can be used for dental extraction, in the setting of a general dentist, trained at providing this sedation to children. This can reduce the needs for a general anaesthetic that can only be conducted in a hospital setting. Sedation depresses the central nervous responses, thus allowing quality care, without the negative psychological response to treatment, but with verbal responses and protective reflexes maintained throughout (Hosey 2002).

Sedation can play a useful role in the dental treatment of children under 12 years that do not require their treatment to be carried out under general anaesthetic.

In June 2015, a report on Sedation and General Anaesthesia for Dental services in the North East was conducted (Douglas 2015). The report found variable rates in the provision of conscious sedation

across the North East. The findings from the report suggested that some procedures that are carried out under sedation in some areas, might be conducted under General anaesthetic in hospitals in others. In areas with higher age standardized rates of dental decay, there was a slight increase in the rates of sedations carried out (Douglas 2015). Age standardised sedation rates for Northumberland were 68 per 10,000 population (with the rate for 0-19 year olds being 75 per 100,000 population) (Douglas 2015). The rates of sedation in the North East and Cumbria were highest among 5-9 year olds and second highest among 10-14 year olds (Douglas 2015).

There is significant variation in the rates not just by Local Authority, but there is also significant variation on a ward level, with the lowest ward level age standardised rate being in Haltwhistle (2.66 per 10,000) and the highest rate for Northumberland being registered in Amble (244.44 per 10,000) (Douglas 2015).

Limitations of the data presented is the fact, that private providers were not included in this report, and the rates represent NHS providers only. Data from the Newcastle Dental School was also not included in the report. This could lead to an underestimation of the true rates of sedation. Despite this, there are suggestions, that in some areas, there might not be adequate provision of sedation services for the population's need, and that the availability of sedation services could help in reducing the rates of dental treatment under GA (Douglas 2015).

Sedation rates as well as rates of dental extractions under general anaesthetic are likely to be influenced by a range of factors. Some of these will include the availability of sedation and general anaesthetic provisions, as well as patient preferences. The distance to these services might be a determining factor. The presented results present a snapshot in time, and give a description of current practice. They do not allow an assessment of clinical need or as to whether the need is met or not. Further exploration of this aspect could be useful to understand better, if the treatment need is met for Northumberland residents, or if there is an under provision of sedation services (as suggested by the 2015 intercollegiate report (Douglas 2015)) or if there is in fact an over utilisation⁴⁴.

However the high numbers of dental extraction under general anaesthetic and sedation, highlight the fact, that there is a high prevalence of dental decay in the childhood population, requiring interventions. Strategies aimed at preventing dental decay should lead to a reduction in rates of dental extraction under sedation or general anaesthetic in children.

Orthodontic services

Orthodontics is the *"branch of dentistry that dealing with irregularities of the teeth (as malocclusion) and their correction"*⁴⁵ Patients in receipt of NHS dental care are required to meet a minimum level of need, defined through the Index of Orthodontic Treatment Need (IOTN)⁴⁶, in order to access NHS orthodontic treatment (Landes 2014). Specialist Orthodontic services are provided by Newcastle upon Tyne or North of Tyne providers, for residents in Northumberland (Landes 2014 a).

⁴⁴ rates higher than expected for need.

⁴⁵ Definition from Merriam-Webster Dictionary. Available online through: <http://www.merriam-webster.com/dictionary/orthodontics>.

⁴⁶ Further information on definitions of different grades of IOTN can be found under: www.bos.org.uk/Public-Patients/Orthodontics-for-children-teens/Fact-File-FAQ/What-Is-The-IOTN

In 2014, a study was conducted to determine the equity of access for children to orthodontic services across the North East, based on dental activity data (Landes 2014a). The report incorporated 8 years of data from 2007-2014 (included). The total claims for Northumberland for orthodontic activity from 2006-2014 were 15,521, which leads to an average claim rate for the 12 year old population(averaged over the 8 years) of 0.5447. This is one of the lowest rates in the North East, with only Eden (0.4924), Newcastle upon Tyne (0.47452) and Allerdale (0.4948) having lower rates. The highest rates were in Hartlepool (1.3496) followed by South Lakeland (1.1171) and Sunderland (0.9486). Over the North East and Cumbria, there has been an increasing trend, of patients seen (number of patients with 1 or more Unit of Activity) between 2006/07-2013 leading to an increase of 26% in 2013 (compared to 2006 baseline of activity). However, the rate was slightly lower in 2014 (being 17% higher than 2006 baseline).

On a national level, the described pattern of inequalities, as described in relation to the prevalence of dental decay, as well as their risk factors, also persists, in access to orthodontic treatment. The children's dental survey in 2013 found that 32% of 15 year olds, who still had a need for orthodontic treatment and were not receiving it in children that were eligible for free school meals, compared to 17% for children aged 15, not eligible for free school meals (HSCIC 2013).

It is likely that this pattern would be the same in Northumberland. A further exploration of orthodontic need, as well as access to orthodontic treatment for residents in Northumberland would be beneficial.

Out of hour dental care

The need for urgent and unscheduled care arises as a result of a complex multifactorial process influenced by the oral health of the population, the quality of dental care, the compliance of patients with oral health care advice as well as patient's health care seeking behaviours (Landes 2014b).

Urgent treatment is defined as "a course of treatment that consists of one or more treatments listed in schedule 4 to the NHS Charges Regulations (urgent treatment under Band 1 charge) that are provided to a person in circumstances where a) a prompt course of treatment is provided, in the opinion of the Contractor, that person's oral health is likely to deteriorate significantly, or the person is in severe pain by reason of his oral condition, and b) treatment is provided only to the extent that is necessary to prevent that significant deterioration or address that severe pain;" (Landes 2014 b-referring to Standard GDS contract)

The need for urgent care can thus be a result of a primary dental disease (including dental trauma), a result of dental treatment, or as a result of the quality of care provided, in the wider sense (Landes 2014b). Therefore there is likely to be significant variation in the need for urgent care between different areas and over time.

A number of different situations can lead to the need for urgent and unscheduled care of individuals. In case of dental emergencies (dental trauma, dental haemorrhage or increasing dental swelling/ airway threatening swelling) Out-of-Hours dental emergency and advisory services are available at the dental Hospital in Newcastle upon Tyne. These services can also offer advice and treatment, as felt appropriate by the reviewing dentists, for conditions requiring urgent treatment (like dental infections, broken fillings/ loose crowns, acute periodontal conditions etc.) the variation in urgent

care rates per 1000 population in local authorities in the North East was presented by D. Landes (Landes 2014 b) based on data from 2012/13, showing Northumberland to have a fairly high rate of urgent care (with 24.6 per 1000 population, this is the 3rd highest rate, after Newcastle upon Tyne(25.7) and South Tyneside (26.8))(Figure. 32). These rates are based on data from NHS dental contractors as well as calls made to the 111 telephone service (Landes 2014b).

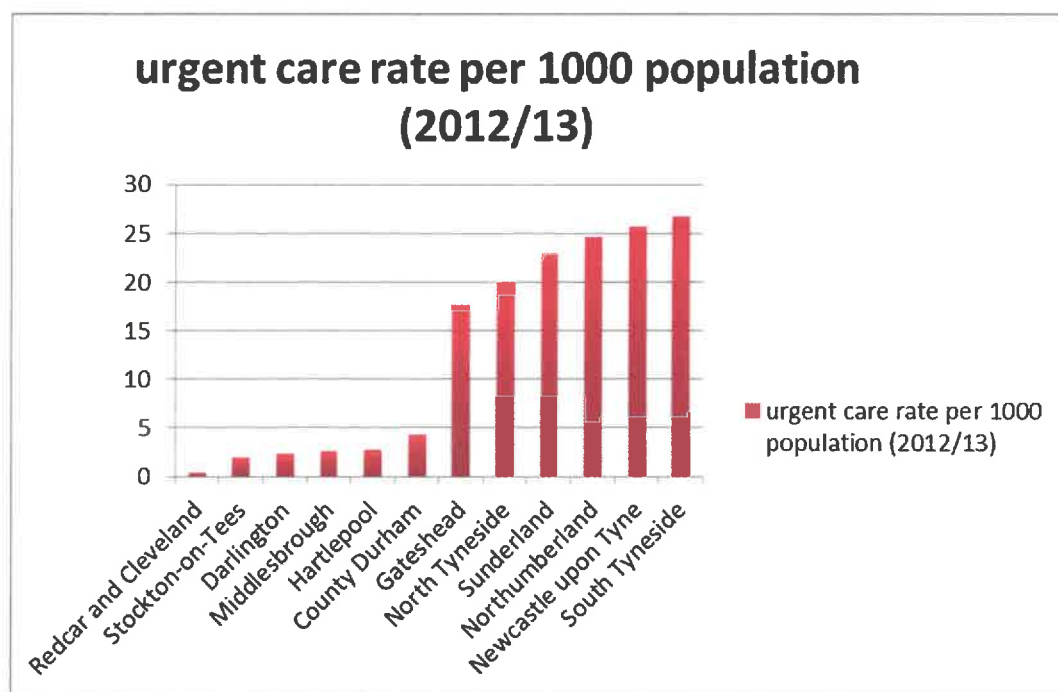


Figure 25: rate of urgent care per 1000 population by local authority in the North-East (2012/13)(data from Landes 2014 b)

Over a one year period (2015) there were 655 A&E attendances for Northumberland residents (excluding the dental hospital in Newcastle upon Tyne) for Dental Investigation and or treatment and relating to Facio-Maxillary Conditions.

Access to these services is through patients contacting the NHS by phone on 111, and being referred into the service. There is no direct access to the service available outside of this route.

The report presented urgent treatment received by patients across the North East by age bands. This showed a disproportionate use of urgent care by those aged 19-29, and also an increase in the age group 29-34 years of age. There was no correlation of uptake of urgent care with levels of deprivation, thus no evidence that levels of deprivation had any influence on the uptake of urgent treatment only in patients (Landes 2014 b). There was a slight over representation of people living in “major urban conurbation” in accessing urgent care only, and a similar size under representation of dwellers in “urban city and towns “accessing urgent care only. The proportion of urgent care only uptake was proportionate to the setting for all other setting categories (Landes 2014 b). This information captures the whole of the North East and Cumbria, and not solely for Northumberland. A further exploration of uptake of urgent dental care would be beneficial, especially in the age groups of high attendance. As uptake of NHS dental care was found to be low in this age group in

Northumberland, activities increasing uptake of routine NHS dental care might be one element of a strategy trying to address this problem that could be explored.

Dental Health Public Health Services

Oral Health Promotion

Oral health promotion is an important element in the strategy of improving oral health, especially for those with the greatest needs. Oral Health promotion aims to reduce the prevalence of oral disease and reduce oral health inequalities across all age groups within a population (Northumbria Healthcare 2015)

With the implementation of the Health and Social Care Act (2012) responsibilities for health improvement, including oral health improvement was transferred to the local authorities (PHE 2014 (g)). Among the statutory duties of local authorities is the provision or commissioning of oral health promotion programmes to improve health of the local population, to the extent that they consider appropriate in their areas (PHE 2014 (g)).

Northumberland County Council currently commissions its oral Health Promotion services through Northumbrian Dental Services (Northumbrian Healthcare NHS Foundation Trust). The aim of the oral Health Promotion service is to provide targeted interventions, aimed at families with children aged less than 5 years of age, as well as delivering quality driven programmes for vulnerable groups in the local population.

The key basis of the promotion of good oral health in the programme is based on the evidence based messages of

- Reducing the frequency of consumption of food and drinks containing sugar to no more than four times a day (three meals and a snack). Avoiding sugar at bedtime, in the one hour before and during the night
- Reducing the frequency and consumption of food and drinks that increase the risk of tooth erosions, fruit juices and teas
- Brushing teeth and gums thoroughly every night and one other occasion in the day using appropriate fluoride toothpaste, spitting out excess and not rinsing with water
- Attending the dentist for regular check-ups
- Keeping alcohol consumption within recommended limits
- Discouraging the use of all tobacco products e.g. cigarettes and Paan (Department of Health, 2009)

The oral health promotion approach taken is evidence based and follows recommendations by NICE.

The Oral Health Promotion Services are delivered across Northumberland. The main activity is aimed at 3 geographical areas (Table 16)

Geographical area	Communities within Area
Area 1	Berwick, Tweedmouth, Spittal, Seahouses, Alnwick, Amble, Ellington, Newbiggin, Lynemouth, Red Row, Broomhill, Widdrington, Ashington

Area 2	Cambois, Blyth, Pegswood, Choppington, Guidepost, Stakeford, Bedlington, Cramlington
Area 3	Prudhoe, East Hexham, Haltwhistle and surrounding area, Bellingham and surrounding area

Table 15: Table of geographical areas and communities covered by Oral Health Promotion services in Northumberland. From Service Specification 2014-2015

Within the overall oral health promotion contract, there are four main programmes of work. Table 17 outlines these main work streams, with a short description of the service covered under each programme. It also gives the programmes' summary activities including targets for the year 2014-2015.

Name of programme/ focus group of programme	Description of programme	Summary activity (activity in year 2014-15)
Childsmiles (children under 5 years of age)	<ul style="list-style-type: none"> -Targeted into areas identified as having poorest oral health based on the National Dental Epidemiology Programme. - partnership working with Children's Centre Staff, Health Visiting Teams and school settings , the OHP team trains professionals in the key OHP messages , helping build capacity of local staff , and enabling them to cascade the information to children and their families - award scheme for children's centres to be accredited. 	<ul style="list-style-type: none"> 1) No. of parents/carers attending oral health information session (274) 2) No. new CCN and schools completing award (17) 3) % of CCN retaining accreditation (88%) 4) No. of professionals attending OHP training sessions (104) 5) Brief intervention contacts (455)
Older people in care setting	<ul style="list-style-type: none"> -A quality assurance award scheme, benchmarked against the Essential Standards of Quality and Safety (CQC 2010) has been developed, to recognise existing good practice, promote partnership working and support the implementation of good oral health practice. - training of staff Provision of oral health care needs assessment tools Provision of printed oral health information for residents, families and care home staff -customer satisfaction questionnaire as part of award scheme 	<ul style="list-style-type: none"> 1) No of professionals attending OHP training sessions (61) 2) No of care homes successfully completing the care home award (4) 3) Percentage of care homes retaining accreditation (100%)
Special needs programme	<ul style="list-style-type: none"> -continually developing service targeting specific groups and settings including Adult Education Centres, residential settings and special needs settings for children and young people 	<ul style="list-style-type: none"> 1) No of professionals attending oral health training sessions (66) 2) No of settings involved in

	-targeted at those who are at greatest risk of poor oral health due to complex health or social needs e.g. adults and children with physical or learning disabilities living at home with their families, independently or in a support care setting in the local community	making changes to their environment that are conducive to the positive oral health experience of children and adults with special needs (12)
OHP for Special Care setting	-Aimed at carers of children and adults, identified as having a "special need" e.g. children attending special schools, adults and children with learning difficulties, adults and older people with supported living arrangements, adults and children with autism -to promote the importance of dental health, to facilitate routine access to dental services and to establish positive oral health routines	1) No of parents/carers attending oral health information sessions and resulting in changes in knowledge (55)

Table 16: Description of work streams of OHP with activity summary from 2014/2015. Taken from Annual Report 2014-2015, produced by Julie Fletcher, May 2015. note: CCN : Children's Centre Nurseries, OHP: Oral health promotion

There are other health promoting approaches addressing oral health being delivered outside of the oral health promotion contract. These are, for example, around working with schools and oral health promotion and addressing oral hygiene as well as the intake of sugar is part of the Healthy School Northumberland Award scheme; Schools have to evidence how they are addressing this aspect, in order to meet the criteria for the award. Information about how schools are addressing oral health promotion is currently collated for all participating schools. In the financial year 2014-15, 17 schools achieved the Childsmiles award, and 15 schools retained the Childsmiles Award status, thus 32 schools are currently on the Childsmiles award scheme in Northumberland.

Improvement of diet, and reduction of sugar intake

Dental decay is caused by demineralisation of enamel and dentine at an acidity level of PH5.5 and pH 6.0 respectively. Post-eruptive sugar exposure is one of the main factors leading to dental decay (Banoczy 2009 referring to WHO 2003a), as the fermentation of dietary sugars in the mouth causes acidity levels leading to demineralisation (SACN 2015). Saliva helps protect against decay, by neutralising and buffering of the acid, as well as providing calcium and phosphate for the re-mineralisation of the enamel (SACN 2015). Tooth decay therefore is a result of excessive (in frequency or extent) demineralization, that is greater than the re-mineralization capacity of saliva (SACN 2015).

Many developed countries, like England, have high levels of sugar consumption in the general diet. As high intake of sugar is not just linked to dental decay, but also to levels of obesity, and with it the metabolic consequences like diabetes, there is a strong commitment to address dietary behaviours in the population and to reduce sugar consumption by policy makers in health. Public Health England is advising the Department of Health in strategies to reduce sugar consumption in England (PHE 2014 (a)). Activities aimed at reducing both, the frequency and the overall amount of sugar consumptions in the population, are likely to have a beneficial effect on the oral health of children and the overall

population. It is not only the overall amount of sugar consumed, that can have a negative impact on oral health, but also when and how often it is consumed. There is also an importance of highlighting potential negative effects on teeth from perceived “healthy foods” though high levels of sugars or acidity (for example: high sugar energy drinks, high sugar cereal bars, high acidic fruit juices.) A systematic review by the Scientific Advisory Committee on Nutrition (SACN) ⁴⁷ has also found, after adjusting for tooth brushing, that the consumption (amount and frequency) of sugar containing beverages (adequate evidence) and sugars-containing foods (limited evidence) in particular to be linked to the development of dental decay (SACN 2015).

Responses to the Health Related Behaviour questionnaire for Northumberland in Secondary schools in 2015 showed reported frequency of intake of sugar containing food stuffs and drinks (Figure 33/ Figure 34) . A high percentage of responses stated that fizzy or energy drinks were consumed rarely “or never “ or “once a week or less”. This is very encouraging, however just over 1 in 5 respondents stating drinking “other fizzy drinks”⁴⁸ on most days , and slightly more stating they consumed these drinks on 2-3 days a week. Thus further work to build on this encouraging finding, to further reduce the consumption of sugary drinks and beverages will could be beneficial, to improve the oral health of young adult. This age group could provide a key group to engage with, as most young people in this age group are likely to have permanent dentition, and their health related behaviours will therefore affect their adult teeth, and therefore have a direct consequence on their future health and wellbeing.

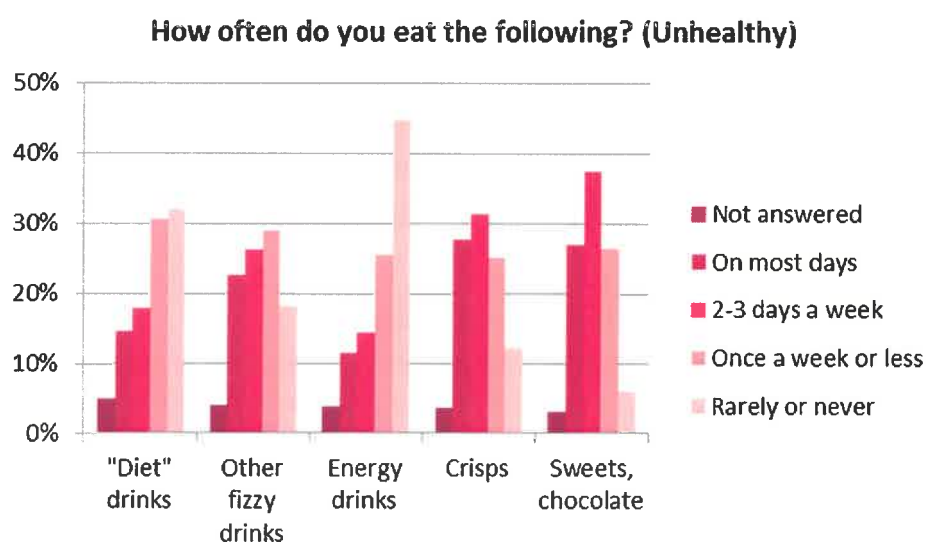


Figure 26: responses from the HRBQ 2015 (Northumberland) in relation to snacks and drinks consumed on "most days" (Data source: Health Related Behaviour Questionnaire 2013 results)

⁴⁷ The Scientific Advisory Committee on Nutrition (SACN) provides nutrition and related health advice to Public Health England and other government agencies and departments in the UK.

⁴⁸ “other fizzy drinks” as opposed to “diet” drinks .

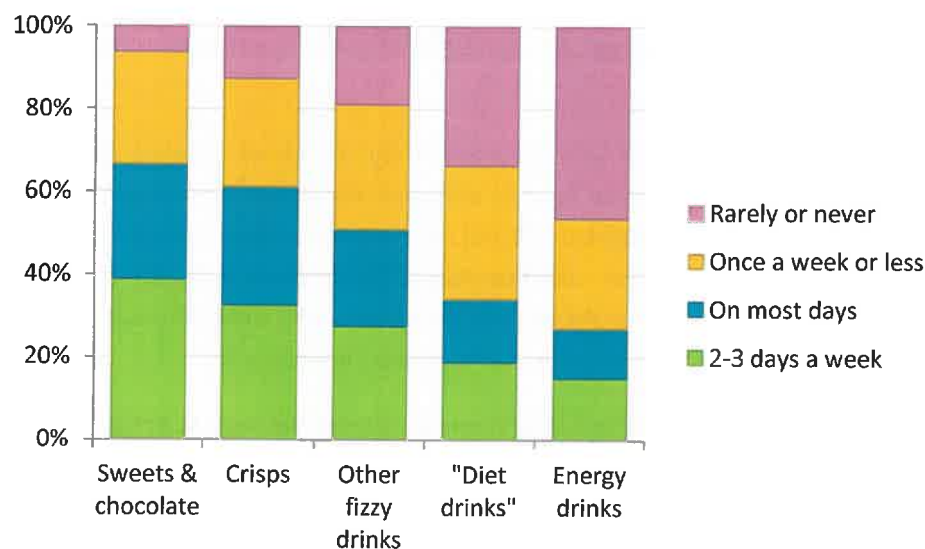


Figure 27: % of Northumberland children completing the HRBQ who consume unhealthy foods and how frequently (Data source: Health Related Behaviour Questionnaire 2013 results)

In keeping with the common risk factor approach, reducing sugar intake and increasing the awareness of the harm caused by sugar on health, is part of the health visitor's contract, as well as promoted in children's centres and other childcare settings. However there is currently no data available to determine the extent to which this is being conducted in different settings, and as to whether this work has been successful in reducing sugar intake for children and their families.

As part of the oral health promotion contract, the oral health promotion team delivers teaching sessions to childcare providers, schools and families, and this has increased the awareness of oral health behaviours in those attending the sessions. The aim of conducting oral health promotion with the providers is also, that they are able to deliver oral health promotion and encourage oral health practice in their respective settings.

Availability of Fluoride

Fluoride is a naturally occurring mineral that has been found to play a part in the mineralisation of teeth's enamel and have a protective effect against dental decay in both deciduous and permanent dentition (Marinho et al 2003, Mullen 2005). It has played an important role in caries-preventing strategies for the last 6 decades (Marinho et al 2003). Fluoride can help reduce the negative impact of Sucrose on the dental enamel to some extent (SACN 2015).

Unlike high sugar consumption the lack of fluoride does not cause dental decay, however exposure to fluoride can offer some protection against the development of dental decay (Banoczy 2009). The benefits of fluoride for dental health and for the reduction of dental decay have long been identified. The main methods of how fluoride benefits the teeth is thought to be around fluoride's impact on mineralization of the teeth's enamel and through the reducing the ability of plaque bacteria to produce teeth harming acids (Banoczy 2009)

Fluoride can either be ingested systemically through naturally occurring or artificially fortified sources (mainly water, milk and salt) or applied topically, through the use of fluoridated toothpaste or varnishes.

The different modes of administration of fluoride have their advantage and disadvantages, but it is argued, that a combination of systemically ingested fluoride and topically applied fluoride provides the best protection for teeth (Marinho 2003; Marthaler 2005). For systemical fluoride provision, water fluoridation is seen as the method of choice, with fluoridated milk and salt provision seen as an alternative, if water fluoridation is not possible (Marthaler 2005). More detailed information on the different forms of fluoride provision can be found in the Appendix (Appendix 9).

Ingestions of high amounts of fluoride can result in dental fluorosis. Dental fluorosis is a change in the appearance of the tooth's enamel which is caused by an exposure to too high levels of fluoride at the time of tooth development in children. Different levels can be distinguished, with the mildest forms presenting as barely noticeable white flecks, occasional white spots, frosty edges and fine, lacy chalk-like lines to more severe forms of larger white spots and rarely rough, pitted surfaces (CDC 2015). This condition is often mentioned in the context of water fluoridation schemes, however rates of dental fluorosis have been increasing, both among children living in fluoridated areas, as well as those living in non-fluoridated communities. Therefore the use, and potential ingestion of fluoridated toothpastes by young children and during the time of tooth formation (up to 6 years of age), has been considered as an important factor for the development of these changes (Marinho et al. 2003).

In a study conducted by Do et al. in South Australia, there were some interesting findings in relation to OHRQoL perceived by parents and children in relation to dental fluorosis. The study found, that children and their parents, were able to notice the discolouration caused even by mild forms of fluorosis (TF score 1), previously often described as only noticeable to the trained professional. However both parents, as well as children, correlated these changes with their teeth being particularly healthy and attractive. Therefore mild forms of dental fluorosis (TF score 1) were associated with an increased OHRQoL (compared to TF score of 0 or TF score 2-3) (Do 2007).

Community Water fluoridation in Northumberland

The water fluoridation agreements between Northumberland and Northumbrian water date back to 1968. With some minor changes to the geographical areas covered by the scheme having occurred over time since then.

In 2012 there were 25 water quality zones identified in Northumberland, 14 of these supplying fluoridated water and 11 supplying none-fluoridated water to the population. This resulted in 135,480 residents of Northumbria receiving fluoridated water and 179,139 residents receiving non-fluoridated water (based on 2014 population estimates). The fluoridated communities are: Alnwick, Alnmouth, Howick, Embleton, High Newton by the Sea, Seahouses, Haltwhistle, Henshaw, Haydon Bridge, Corbridge, Haddon on the Wall and Prudhoe. Water fluoridation of the area around Berwick was suspended in November 2002, pending capital investment to replace aging equipment at the Fowberry and Murton Water treatment works. There is work underway looking at re-instating water fluoridation to this area. Figure 37 & 38 shows the geographical distribution of the current community water fluoridation scheme overlaid with areas of income deprivation.

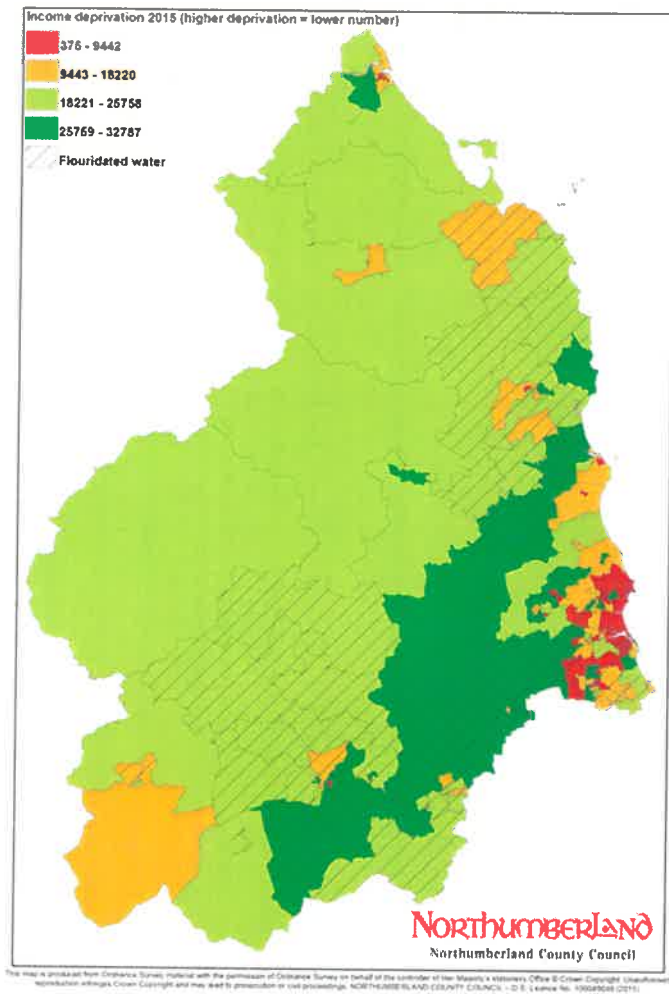


Figure 28: geographical mapping of Water fluoridation in Northumberland County. The shaded areas represent areas currently receiving artificially fluoridated water.

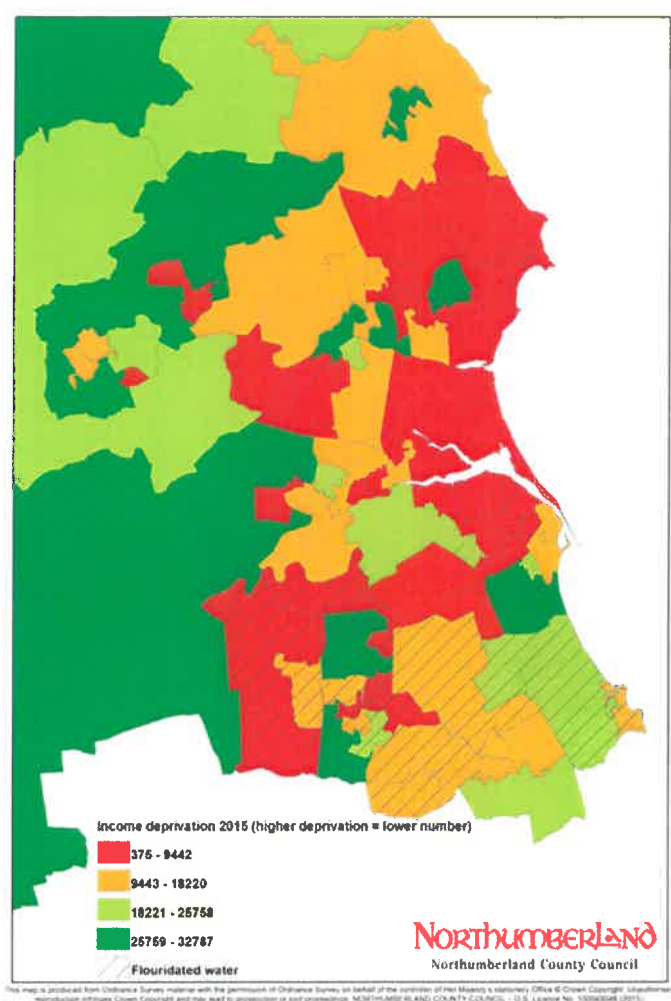


Figure 29: Geographical distribution of artificial Water fluoridation in the South East of Northumberland. The shaded area represent areas, currently receiving artificially fluoridated water supplies.

As has been mentioned above, the benefit of water fluoridation on dental decay reduction reduces health inequalities, by having larger impact in areas of higher deprivation and greater need (PHE 2014 (b)) interestingly, in Northumberland, many areas, with lower levels of deprivation receive fluoridated water, and many of the more deprived communities receive none-fluoridated water supplies (Figure 37/38). The pattern of water fluoridation therefore increases health-inequalities, and disadvantages the population at greatest risk of developing dental decay.

The South East of Northumberland is the most densely populated area of Northumberland, with an agglomeration of many smaller wards over a relatively small geographical area, with many wards having higher levels of deprivation. As the maps above show, some of the more southern wards in this area currently receive artificially fluoridated water, whereas the east and more Northern parts are receiving water with significantly lower levels of fluoride, compared to the desired levels.

We compared the rates of dental decay, based on the findings from the 2011/12012 dental survey, between wards, that are among the 25% most deprived in the country according to income deprivation scores, receiving artificially fluoridated water and those not receiving fluoridated water, in the South East of Northumberland. This showed the rates of dental decay, in the most deprived

wards of the South East of Northumberland County to be higher in areas, not benefitting from artificially fluoridated water supplies. However, there are a number of caveats to mapping the areas of dental decay to fluoridated water supply by level of deprivation.

These factors include:

- The most recent national epidemiological survey of 5 year olds included a small sample size of children per ward, thus limiting interpretations that can be drawn of this data at ward level.
- The level of fluoride in mains water varies as a result of changes to the water flow across the system of water provided by Northumbrian Water. Sometimes the flow has to be changed, in response to changes in availability and demand of water in different parts of the system.
- There is the potential of a halo effect⁴⁹ affecting the assumptions made. The halo effect is a result of children, living in areas that do not receive fluoridated water, benefiting from water fluoridation as a result of, for example, attending a school in a fluoridated area or spending significant amount of time in neighbouring fluoridated areas. As a result they might have better than expected dental health as a result of living in close proximity of an area served by fluoridated water mains.
- Differences in levels of deprivation. The LSOAs reviewed were all among the 25% most deprived, however because of the small number, it was not possible to match them by deprivation score, and thus level of income deprivation might be a confounding factor.
- Differences in other factors relating to oral health. It is possible, that there are other factors that have an impact on oral health, in which the areas compared differ, and that it is not just the absence or presence of Fluoride in the water supply, that is causing the difference in dental decay rates.
- The estimation assumes a static population, and does not take into account shifts in the populations and population mobility and migration patterns.

These are some of the main factors, making it difficult to assess the full impact of water fluoridation on the dental decay rates among 5 year olds in Northumberland. It is recommended, that this aspect should be further explored in future, to inform the dental health strategy for Northumberland.

As mentioned previously, a number of dental extractions are performed under general anaesthetic in children and young people. A review of all hospital admissions for dental extractions performed under general anaesthetic in those aged 1-18 years of age between April 2013-July 2015 showed that the rate of dental extraction was nearly doubled in areas not receiving water fluoridation, compared to areas receiving water fluoridation, when matching the areas by deprivation deciles (Table 18).

⁴⁹ Exposure to fluoride for children living in none-fluoridated areas

Deprivation decile	Rate in fluoridated areas	Rate in non-fluoridated areas	RR
1	14.63	30.18	0.48
2	11.00	24.91	0.44
3	16.88	22.32	0.76
4	9.15	18.80	0.49
5	9.38	13.92	0.67
6	10.40	17.19	0.60
7	10.00	7.62	1.31
8	8.41	9.95	0.85
9	8.80	9.84	0.89
10	5.50	10.97	0.50
overall	9.54	18.97	0.50

Table 17: Rate of dental extraction under General Anaesthetic (April 2013- July 2015) in areas with and without artificial water fluoridation schemes in Northumberland by decile of deprivation.

This local finding, of rates of dental extraction under general anaesthetic in non-fluoridated areas to be about double that of areas of the same level of deprivation in a fluoridated area, is in keeping with the findings of PHs monitoring report on water fluoridation, which showed a reduction of dental extraction under General anaesthetic among 5 year olds by 46 % (PHE 2014 monitoring report). This would mean, by extending water fluoridation to cover the whole of Northumberland, 146 dental extractions under general anaesthetic might be prevented every year. It is important to remember, that dental extractions under general anaesthetic in 0-18 year old, is not the primary treatment of dental decay, and this treatment is reserved for the very severe forms of disease, or if there are other factors relating to the patient, that require this invasive intervention. A 3 year cohort study of 739 children in the North West of England suggested the rate of primary molar tooth requiring extraction to be 1 in 10 among children with caries (and 1 in 40 in children without caries) (Tickle 2008). Water fluoridation is therefore likely to reduce the overall incidence of dental decay significantly, in order to lead to the reduction in dental extraction under general anaesthetic by half. A systematic Cochrane review on the effect of introducing water fluoridation suggested a potential reduction of dental decay by 35 % (for primary dentition) and 26% in permanent dentition (Iheozor-Ejiofor 2015). The dental monitoring report published by PHE for the purpose of monitoring water fluoridation schemes gave slightly more conservative estimates, with an on average reduction of 15% of dental decay in fluoridated compared to non-fluoridated areas. However, once deprivation and ethnicity were accounted for, the impact was more similar, with a 28% reduction of dental decay among 5 year olds (PHE 2014 (monitoring report)). Among 12 year olds, the reduction of dental decay was found to be about 21% (taking deprivation and ethnicity into account) (PHE 2014 monitoring report)

The financial cost saving resulting from not carrying out 146 dental extractions under general anaesthetic amounts to a saving of £82,821.4 per year (assuming the average cost per care episode of £ 565.89). However, it is important to remember, that the financial cost is only a small consideration in this. The cost of suffering from severe dental decay, pain, lack in sleep, issues with

self-esteem, having time off school, parents having to take time of work etc. is the real burden of the disease. Table 9 also highlights, that the impact of water fluoridation, in reducing the need for dental extraction under general anaesthetic, is evident across all deciles of deprivation (using the IMD). Water fluoridation is often seen as an intervention with the potential of reducing health inequalities, and benefiting the most deprived most, but it is important to remember, that everyone's oral health will be benefitted by water fluoridation, irrespective of the level of social deprivation.

The Faculty of Dental Surgeons (RCS) sees dental extractions under general anaesthetic as an indication of inappropriate treatment at primary dental care level. This could be as a result of late presentation of children to the primary care dentist, with advanced stage of disease (RCS 2015: The state of Children's Oral Health in England). Therefore, other preventative measures, and measures increasing children's uptake of primary dental care services, could help reduce the need for dental extractions under general anaesthetic further.

Reviews of clinical effectiveness by NICE (PHE55) and PHE (Commissioning Better Health for Children and Young People, 2014) have suggested high returns on investment for water fluoridation, with for every 1£ invested yielding a return of £12.71 after 5 years and £21.96 after 10 years (figure 39). This exceeds the return on investment for all other oral health improvement programmes for 0-5 year olds, even though, many of these (like the combined targeted provision of toothbrushes and paste by post and by health visitors) also showing a high return of investment (Figure 39).



Public Health
England

Return on investment of oral health improvement programmes for 0-5 year olds*

Reviews of clinical effectiveness by NICE (PHE55) and PHE (Commissioning Better Oral Health for Children and Young People, 2014) have found that the following programmes effectively reduced tooth decay in 5 year olds:



*All targeted programmes modelled on population decayed, missing or filled teeth (dmft) index of 2, and universal programme on dmft for England of 0.8. The modelling has used the PHE Return on Investment Tool for oral health interventions (PHE, 2016). The best available evidence has been used in this tool and where assumptions are made these have been clearly stated
PHE Publications gateway number: 2016321

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Figure 30: returns on Investment of oral health improvement programmes for 0-5 year olds. Infographic developed by PHE, taken from PHE Publication Gateway number 2016321⁵⁰,

The cost for community water schemes for Local Authorities comes in under £1 per capita of the population served. This highlights the low cost of providing community water fluoridation and the great benefit derived from this. Currently, the per capita cost of water fluoridation in Northumberland is £ 0.72.

The responsibilities to fund the running costs of community water fluoridation programmes, in areas where they exist, lie with local authorities. In areas, currently not served by a scheme of water fluoridation, it is the statutory responsibility of a local authority, to consider if implementing such a scheme is feasible and would benefit the health of the local population.

The 2015 HRBQ asked y8 and y10 students how much water they had drunk the day prior to the survey. 32% of pupils responded that they drank at least 'about a litre' of water on the day before the survey (9% responded that they didn't drink any water on the day before the survey) (Figure 40).

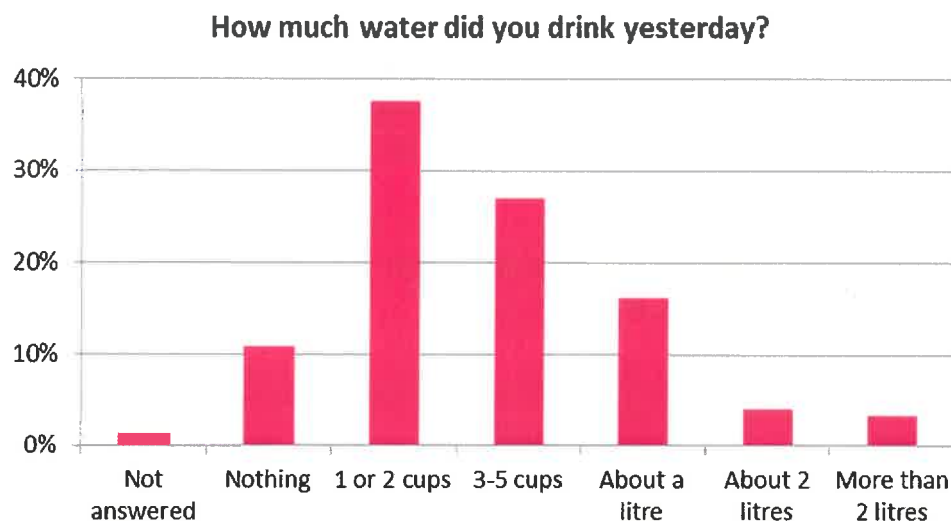


Figure 31: Responses to the question ' how much water did you drink yesterday' in the Northumberland HRBQ 2015.

Public opinion

Dental services, like any health care services need to be easily accessible to the population, acceptable and meet the needs of the population they are supposed to serve. Therefore, obtaining feedback form patients and the population about issues with services, barriers to their accessibility and use, as well as satisfaction with available services are important information, to allow service improvement to take place. Engaging services users and the population served by these services can be a difficult task. Especially ensuring, that the information obtained is representative of a wide range of service users, and do not just represent the views of a small group of service users. Ensuring

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https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/560973/ROI_oral_health_interventions.pdf

the voice of the population is accurately captured is therefore important. There are a number of existing mechanisms in place, to capture patients and service users' experience. The existing methods and their findings are presented below. Primary service user engagement, and information collection was felt to be important to obtain a more complete picture, and is presented in the final section under this subheading.

The 2013 dental survey (HSCIC 2015) assessed the impact of dental health on children aged 12 and 15 through collecting self-rated oral health related quality of life as well as the Child Oral Impacts on Daily Performance measure (Child-OIDP) in the 3 months preceding the survey date. The survey found 58% of 12 year olds, and 45% of 15 year olds to have had at least one oral health related impact, with about a third (36% of 12 year olds, and 27% of 15 year olds) stating they were embarrassed to smile or laugh, and a fifth (22% of 12 year olds and 15% of 19 year olds) experiencing difficulties in eating (HSCIC 2015)⁵¹.

GP survey

As part of the GP survey, conducted across England, participants in the survey also are asked to respond to questions, relating to NHS dentistry. These questions relating to NHS dentistry are in relation to patient trying to get an NHS dental appointment for themselves, being able to make an appointment, and reason for not making an appointment.⁵²

Friends and Family test

From the 1st of April, NHS England commissioned dental practices have to implement the NHS Friends and Family Test (FFT). The FFT is a feedback tool, giving service users the opportunity to feedback on their experiences. The aim is to be able to use this feedback to aid service improvement.

The results between different practices cannot be used to compare practices, but it can inform patients and service users for each practice, and allows the practice to use the feedback to improve over time. Practices are required to submit the completed feedback for patients receiving NHS England funded treatment on a monthly basis to NHS England. The FFT can be tailored to the needs of the individual practices, however it does need to have a t least one free-text option, following the initial questions asked.

The initial question is: "We would like you to think about your recent experiences of our service. How likely are you to recommend our dental practice to friends and family if they needed similar care or treatment?" The responses are: 'Extremely likely'; 'Likely'; 'Neither likely nor unlikely'; 'Unlikely'; 'Extremely unlikely'; or 'Don't know'.

Patients attending emergency dental services, or receiving non NHS funded care, can also be offered to participate to give feedback, however only the feedback of patients having received NHS funded treatment, should be submitted to NHS England (NHS England 2014 (b)).

Community engagement through Health-watch

To ensure that the communities' voice is captured, as part of this oral health needs assessment, Health watch was involved, to help capture the views of representatives of different communities. . A

⁵¹ <http://www.hscic.gov.uk/article/6181/More-than-a-third-of-12-year-olds-embarrassed-to-smile-because-of-their-teeth>

⁵² Link to GP survey July 2015: <https://gp-patient.co.uk/surveys-and-reports#july-2015>

questionnaire was developed, and trailed by the Public Health team, as well as the ADAPT staff. Suggested changes were made to the questionnaire following this initial trial. After this, Health Watch and the local council circulated the questionnaire. The questionnaire was promoted on different occasions to try to increase the reach. The questionnaire consisted of 40 questions relating to different aspects of oral health, with a combination of multiple choice questions and free –text options. The themes that the questionnaire explored could be grouped into 5 topic areas:

Good oral health related perceptions

Access to dental services

Dental hygiene practices

Access to fluoride

Consumption of sugar containing foods and drinks

The full list of survey questions can be found in the Appendix of this document.

Results of the survey

A total of 170 responses were collected by the online survey. The results were analysed by reviewing the counts of answers to the questions, and grouping the themes from free text answers.

The full overview and results of the survey can be found in the appendix of this document (appendix10).



The response to the questionnaire showed that oral health was important to the respondents. Most respondents rated their oral health as at least good, and the knowledge of good dental hygiene practice was encouraging.

Another key factor for respondents was the cost and convenience/availability of NHS dental appointments in deterring respondents from accessing NHS dental care. This finding is not unexpected, especially in view of Northumberland's geography, but it will be useful to feed this back

to NHS England, as the commissioners of dental services especially in view of the reform of the dental contract.

Recommendation:

A further more in depth exploration of dental health issues of residents in Northumberland would be valuable, and help plan services meeting the needs of residents. These preliminary findings should be communicated to NHS England commissioners as well as the professional dental network to help inform their commissioning and work.

Existing information:

As part of different work streams within the Public Health team, different forms of obtaining the population's views have been used. Some of the information from these projects, has relevance for oral health needs as well, and is thus presented here as well.

Young People's Health Services

This report presents young people's positive and negative experiences of health services, and the information was obtained through the use of a questionnaire, conducted by Health Watch Northumberland, the 1001 voices project and Northumberland Youth Services. Links to the survey were sent to all high schools in Northumberland, and the schools were encouraged to allow the children 10 minutes of the class time, to complete the questionnaire. It was also distributed to other youth groups, youth workers and youth representatives, and circulated through social media approaches, to reach as many young people as possible. A total of 217 young people (aged over 13 years) completed the survey. The respondents came from a range of geographical areas across Northumberland. The majority of respondents were female (86%) with the majority aged between 15-16 years (42%) or 17-18 years (39%). Around one in ten respondents were aged 13-14 year olds (8%) or aged above 19 year olds (11%).

The responses to the questions within the survey relating to oral health are presented below.

Question: Do you feel you can access all the necessary and relevant health services for your age group?

87% of respondents knew where their dentist was, and 61% felt that they could access their dentist easily. Comments relating to this question about access to different health services (not specifically relating to dentists) indicated that the remoteness of Northumberland was an issue, with difficulties of transport being a major barrier mentioned by young people.

Question: Please indicate when you last visited the services. Dentist

93% of respondents had visited their dentist within the last year, and 1% indicating that they had never seen their dentist. This is an encouraging finding, that a large majority of young people had attended their dentist for an appointment in the last year. 7% could not remember when they had last had a dental review, so these students might have also have had one, within the last year.

Question: In your opinion, how long do you think is a reasonable/ acceptable time to wait to get an appointment with the following service?

The majority (41%) of respondents felt that it was appropriate / reasonable to wait for 1 week to obtain a dental appointment, with the second most common response being 2 weeks (22%). About 16% of respondents wanted to be able to obtain a dentist appointment within 1 or 2 days.

Question: Please indicate if you have ever found it difficult to make an appointment with the following services.

Dentist:

22% of respondents indicated that they had had difficulties accessing dental services. With the reasons for the difficulties discussed as

- Dental practices being busy
- Appointment times conflicting with young people's availability with an impact on school
- Rescheduling or cancelling of appointments

(Healthwatch Northumberland 2015)

The findings from this questionnaire provide useful information

Northumberland Young People's Health Roadshow 2015

The road shows are annual activity that is part of Northumberland Public Health Service contract serving the purpose of gathering information from young people regarding their access to health services and health information and providing brief health interventions and signposting on a range of health topics (Northumbria Healthcare 2015)

The road shows in 2015 took place in South East Northumberland, and area identified as it is an area with high levels of young people living in socioeconomic deprivation, as well as having high rates of teenage conceptions, as well as high rates of mental health issues.

Over the 3 conducted roadshows, 107 questionnaires were received (39 males and 68 female) from young people aged 9 to 22 years of age.

The questions asked were the following:

- Where do you get information about health issues?
- What health issues are important to you?
- If you were worried about your health, who would you talk to?
- If you talk to your parents/ carers about health, what is the most important issue they about could discuss with you?

The answers did not provide specific reference to oral health or dental services. However healthy eating was identified as an important health issue among the participating young people. It is not clear why the young people identified this as an important aspect, if it was in relation to weight, health benefits or oral health. As oral health was largely not addressed, it is likely that the health diet was more motivated by the effect on weight, as this seemed to feature more prominently among the responses. The lack of importance of oral health for the young people also resonates with the lower rates of dentist attendance among young adults (20-24 years of age, presented above) , and could

suggest that young people and young adults do not perceive oral health as an important aspect of their overall health.

Recommendation

Further population engagement will be required to fully understand enabling factors as well as barriers to better oral health in different groups of the population across the entire geographical footprint of Northumberland. In order to achieve this, it is recommended that meaningful engagement with residents across Northumberland is conducted.

Discussion

This oral health needs assessment sets out to identify some of the information available in relation to the oral health needs of the population of Northumberland. As a first step in a cyclical process of needs assessment, it identifies some areas of good practice that can be further developed.

One of the major difficulties for local authorities, when planning to fulfil their role in oral health improvement for their local populations, is the availability of data that allows the targeting of interventions to the needs of specific groups or in geographical areas.

In the absence of robust oral health data on local population level, proxy measures (like levels of socioeconomic deprivation for dental decay) have to be used to plan oral health improvement approaches. This is not the best way to plan services, and means, data to evaluate the success of interventions is also not readily available, and has to be specifically collected.

In order to help with this, Northumberland has commissioned a census level epidemiological survey, for the next round of the national epidemiological survey. This will allow a better assessment of the oral health needs of children living in Northumberland to take place. This, together with the oral health survey of adults and older people, having been conducted by Northumbrian Healthcare services for the National Survey, will be able to inform oral health promotion activities further.

The available evidence, suggests that the oral health of the population in Northumberland overall, is similar to the England average. However, it is clear that there are prominent health inequalities, with pockets of greater need and poorer oral health in areas of socioeconomic deprivation. These areas have a higher prevalence of risk factors like smoking and alcohol consumption in adults, and decreased rates of breast feeding and good oral health behaviours.

In view of the financial challenges faced by Northumberland County Council, adopting the common risk factor approach and integrating oral health promotion with other health promotion approaches is likely to be the most cost-effective approach to improve the oral health of the population.

Northumberland County Council has well established, close working relationships with a number of professionals that can act as partners in oral health, as outlined by the Department of Health in *Valuing People's Oral Health* (DoH 2007)) (table 22). The Department of Health publication is aimed at improving the health of children and adults with disabilities, however

oral health improvement can also be delivered to none-disabled adults and children in contact with the listed partners.

Partners in oral health for Local Authorities	
Health professionals	midwives , health visitors, district and practice nurses, dieticians, specialist nurse practitioners, pharmacists, school nurse advisers , speech and language therapists , doctors ,hospice staff, learning disability nurses
Childcare and education services	childminders, pre-school and nursery staff, teachers ,school governors , parent and teacher associations, catering staff
Social care professionals	carers, catering staff in residential care establishments and day-care centres , learning disability teams , mental health teams
Voluntary sector	for example: national and local support groups for disabled children and adults

Table 18: Partners in oral health for local Authorities as outlined by the Department for Health (DoH 2007)

Dental decay is a preventable disease, thus, despite the positive trends of dental decay prevalence in recent years, and Northumberland's rates being in line with the national average, there is still substantial room for improvement.

An interesting finding of this oral health needs assessment is that Northumberland's local authority's neighbours have better oral health, in relation to levels of socioeconomic deprivation, and that all of these areas benefit from community water fluoridation schemes covering their entire populations. Northumberland currently has a scheme of community water fluoridation that is increasing oral health inequalities, and not reaching those who would most benefit from such a scheme. In view of the low cost, and high potential return on investment of community water fluoridation, unequalled by any oral health intervention, addressing this inequity, and exploring the feasibility of extending the current water fluoridation scheme is recommended as a priority for Northumberland's oral health strategy from this oral health needs assessment.

An important consideration is that the dental health of some specific population groups have not been addressed as part of this oral health needs assessment and this is a recommendation for the future. Some of potential groups of interest are people with learning disabilities, chronic conditions, homeless people, and prisoners as well as looked after children. It is recommended that the specific needs of these populations groups are considered by Northumberland County Council in every service they commission that has an interface with these population groups.

Health promotion, and oral health promotion as part of this, needs to be integral to the working of all council commissioned services to have the highest possible impact on improving the population's health and reducing health inequalities among different population groups and communities.

Risks /Opportunities:

A number of risks have been identified for the delivery of oral health services. The biggest risks derive from the current economic climate, and budget cuts that all local authorities in England have

to face. Decisions makers within the Local authority are required to identify services and areas of provision, that they can reduce funding to, and thus reduce spend. This has implications for all services currently funded by the local authority. It is therefore fundamental that services are cost-effective and are delivered in the most efficient and sustainable way, to ensure that the best value is derived from the money spend. This oral health needs assessment therefore is a valuable tool, for decision makers.

Another risk arises from the recent restructure following the Health and Social Care act from 2012. It has been 4 years since the move of Public Health to the Local Authority and the formation of new organisations and bodies, like PHE, NHS England and CCGs however, following the restructure and the formation of the new organisations, these bodies had to quickly identify their new roles and responsibilities and address areas of the remit that seemed that not clearly fitted under an organisation's remit. This oral health needs assessment, the first since the transfer of responsibilities for oral health improvement to the local Authority, is an important first step in "taking stock" and moving forward to ensuring oral health needs are sufficiently addressed.

A large element of the work done by the Local authorities is now around contract negotiations and commissioning of providers of different services. This provides an ideal opportunity to integrate health promotion including oral health promotion into all contracts commissioned by the Northumberland County Council.

The current economic climate has had a significant impact on the local population. : Increasing food poverty and dependence on food banks, increased cost of living and lower wages, have resulted in increasing poverty. An Assessment of children in poverty from Northumberland County Council conducted in 2012⁵³ found a local child poverty measure⁵⁴ of 17.8% (range of 1%-57.6% between the ward with lowest to the ward with the highest child poverty measure in Northumberland) which equates to about 9,381 children living in poverty. Thus individuals and families are struggling to provide for themselves and their children. The cost of some healthy food is significantly higher than many unhealthy, highly processed and sugary foods. This means, it is getting more difficult for some families to provide healthy food options for their children. This not only has a negative impact on children's oral health, but also their general health, and the development of unhealthy lifestyle options now and in future. It is therefore especially important for Northumberland County Council to support individuals and families in these difficult times to make the healthier choices the easier and affordable ones.

Summary Findings

The findings of this oral health needs assessment are limited by the quality of the available information on dental health of individuals and populations in England and specifically Northumberland.

This oral health needs assessment finds the dental decay rates among 5 year olds are similar to the England average, but overall rates mask areas of greater need in some wards in the county. Rates of

⁵³ <http://www.northumberland.gov.uk/NorthumberlandCountyCouncil/media/Northumberland-Knowledge/Document%20library/Northumberland-Poverty-and-Worklessness-Assessment-2012-Update.pdf>

⁵⁴ Defined as the proportion of children living in families in receipt of out of work benefits or in receipt of tax credits where their income is less than 60% of median income.

Early Childhood Caries among 3 year olds appear to be higher in Northumberland, when compared to other Local Authority areas in the North East. This will warrant further exploration, as it is likely that there are pockets of higher prevalence in the Northumberland, and targeting intervention to these areas could be a useful step in reducing these overall rates.

The oral health of 12 year olds has been identified as a specific area to address in future, with potentially high levels of unmet need (as indicated in a care index) despite apparent good access to NHS dental services, and good reported oral health behaviours.

Northumberland has a disproportionate older aged population, and addressing the oral health needs of these specific groups, needs to be a focus of an oral health needs strategy moving forward.

The current scheme of water fluoridation increases health inequalities, as it does not provide fluoridated water consistently across the county, and does not serve those at greatest needs. As a highly cost effective intervention that has the potential of reducing health inequalities, and that can improve the oral health for all ages, exploring the feasibility of extending the community water fluoridation scheme across Northumberland should be a priority for Northumberland County Council.

Oral health promotion currently provided to many population groups considered at particular risk of poor oral health, or as a priority for addressing oral health (like children). However, in order to reach a wider population, ensuring that considerations of oral health impacts and creating environments that help to promote good oral health is likely to further improve oral health across the county, with a potential of further reducing health inequalities.

Recommendations

Recommendation 1:

Oral health to be considered a priority for all local stakeholders and oral health improvement activities to be imbedded in all services as appropriate.

Recommendation 2:

To develop and implement an oral health strategy for Northumberland, drawing on the findings of this oral health needs assessment and addressing the areas identified as requiring improvement. As part of the implementation process of this strategy, an evaluation and review of the oral health needs should be conducted, taking into account the recommendation brought forward by this needs assessment.

Recommendation 3:

To address dietary sugar intake as the major causative factor for dental decay, especially in the form of sugar containing beverages and hidden sugars, and to highlight the harmful mechanism of sugar on the tooth's enamel.

Recommendation 4:

To explore the possibility of extending water fluoridation coverage to communities at highest risk of dental decay, and to bring it in line with fluoridated areas in Northumberland, and neighbouring Newcastle and North Tyneside.

Recommendation 5:

Ensure that oral health improvement strategies are mandated all service specifications for Local Authority commissioned services, as appropriate for the respective service commissioned. This could include oral health promotion as an integral part of the contract between the Local Authority and health visiting services, children centres, schools and care homes.

Recommendation 6:

To work together with all council departments, to actively ensure, oral health improvement has been integrated across all council departments considering the wider determinants of health. This could include appointing oral health improvement champions in all departments to increase the profile of oral health.

Recommendation 7:

To continue and increase the work with children and adults at highest risk of dental decay to increase access the dental care, improve oral hygiene practices and reduce sugar intake.

Recommendation 8:

It is recommended, that this information is shared with community midwives, health-visitors, social care staff, and other staff working in early childcare settings, to help promotion of messages that aim to reduce the consumption of sugar containing drinks, as well as shorten the length of time that bottles are used for feeding infants. Clear and consistent messages need to be delivered in health education and health promotion work, aimed at families with young children. In order to reduce the rates of early childhood caries, it is recommended, that the infant feeding policy is reviewed, and revised, if necessary, to address the issues relating to early childhood caries.

Recommendation 9:

Working together with Health visitors, midwives, and other support staff, working with mothers and their infants, to support them in sustaining breastfeeding, but also in ensuring messages to help promote good oral health are communicated to families early on, to help them establish good behaviours, that can be maintained over the life-course.

Recommendation 10:

To increase awareness of oral cancer and the risk factors associated with oral cancer among Northumberland residents, especially for those most at risk, smokers, those drinking more than 25g/day of alcohol and those at increased risk of exposure to human papillomavirus.

It is recommended that this is achieved, by working together with dentists and other professional groups working with individuals and communities most at risk.

Recommendation 11:

As a big problem of assessing the state of children and adults teeth lies in the availability of robust data, this is an area that requires improvement. This is especially important, when implementing new interventions, and assessing their outcomes and effectiveness. Thus evaluation of interventions should be planned in at the intervention stage, with a clear plan, how a benefit can be demonstrated, and what data source are available, or what information needs to be collected.

Recommendation 12

Arrangement of access to data from private dental providers would be beneficial. In order to address gaps in service provisions, are clear picture of where the gaps are filled through private dental provisions. This should be combined with a more in depth exploration as to how patients view this arrangement, and if patients attend private dentists because an NHS dentist is not accessible to them.

Recommendation 13

Ensure that all local health and wellbeing policies address issues in relation to oral health of the population as relevant to their specific area.

Recommendation 14

Further population engagement will be required to fully understand enabling factors as well as barriers to better oral health in different groups of the population across the entire geographical footprint of Northumberland. In order to achieve this, it is recommended that meaningful engagement with residents across Northumberland is conducted.

Recommendation 15

To Ensure public service environments promote oral health as recommended by NICE (NICE 2014/PH55), by Making plain drinking water available for free; Providing a choice of sugar-free food, drinks (water or milk) and snacks (including fresh fruit), including from any vending machines on site⁵⁵ ; Encouraging and supporting breastfeeding⁵⁶; This includes services based in premises wholly or partly owned, hired or funded by the public sector such as: leisure centres; community or drop-in centres; nurseries and children's centres; other early years services (including services provided during pregnancy and for new parents); schools; and food banks.

Next steps:

The findings and recommendations from this oral health needs assessment are intended to influence the development of an oral health needs strategy for Northumberland moving forward. This oral health needs assessment should be viewed as a first step, in an on-going process of assessing the developing oral health needs of the population and informing and supporting commissioning decisions to meet the needs of the populations.

The oral health strategy for Northumberland County Council is advised to have a clear plan for improving the dental health of all age groups of the population, with a specific focus on the "at need" groups highlighted in this document.

In order to achieve this, an integrated approach addressing the multifactorial determinants of oral health and recognising the common risk factor approach is proposed. This will require adopting the 21 recommendations made by NICE in guidance 55 (NICE 2014 /PH55)(outlined above), as well as aligning to the recommendations of improving the children's oral health through the 4 areas of :

⁵⁵ see the NICE guidelines on obesity (<https://pathways.nice.org.uk/pathways/obesity>) and obesity: working with local communities(PH42) <https://www.nice.org.uk/guidance/PH42>

⁵⁶ See NICE guidance on maternal and child nutrition NICE guidance PH 11: <https://www.nice.org.uk/guidance/ph11>

- Access to NHS dental services and specialist paediatric dental services,
- Health promotion and education on dental health for parents and children
- Awareness raising of the impact of sugar on tooth decay, and exploring ways of reducing of sugar consumption
- Exploring and, if feasible, extending the current water fluoridation scheme of Northumberland, to reduce oral health inequalities, and improve the oral health of a large proportion of the population, currently not benefitting from water fluoridation.

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Appendix:

Appendix 1:

National Policy Context

Local authorities improving oral health: Commissioning better oral health for children and young people. An evidence-informed toolkit for local authorities (PHE 2014(e))

This toolkit, developed by Public Health England (PHE), supports local authorities in their commissioning responsibilities for oral health promotion programmes and commissioning of oral health surveys.

It highlights the importance in addressing the oral health of children and young people because of the impact of poor oral health on children's quality of life, but also on school readiness and school absences. It lays out recommendation for commissioning of these services taking a life course approach, working with partners when commissioning evidence based services meeting the needs of the local populations, that includes universal services, with targeted intervention for those most at risk.

Independent review of dental services 2009 (Steele 2009)

In 2009 Professor Jimmy Steele, led on an independent review of dental services in England. The review aimed to identify the problems in NHS dentistry from the viewpoint of patients, professionals and the NHS, to review the underpinning principles of the NHS as they might apply to dentistry and to build on this vision to try to identify contractual and organisational solutions and to clarify who is responsible for delivering these.

The main recommendation following on from the review, were in relation to

- accessibility and quality of dental services
- the alignment of the dental contracts to facilitate this

The state of Children's oral health (RCS 2015)

A recent report by the faculty of dental Surgery at the Royal College of Surgeons of England, published in January 2015, summarizes the existing evidence of the state of children's oral health in England (RCS 2015). Their findings re-emphasise the known situation of significant regional inequalities in the oral health across England. The review puts forward a number of key recommendations. These recommendations are in relation to;

- **Access to NHS dental services and specialist paediatric dental services,**
- **Health promotion and education on dental health for parents and children**
- **Awareness raising of the impact of sugar on tooth decay, and exploring ways of reducing of sugar consumption**
- **To encourage Local authorities without water fluoridation schemes to introduce water fluoridation.**

These recommendations are in line with oral health advice issued by NICE (2014). The oral health needs assessment will therefore have a special focus on these areas, to highlight examples of good practice in Northumberland as well as identify areas for improvement.

Health and Social care act 2012

The implementation of the Health and Social Care Act 2012 changed the commissioning landscape in health and social care in England. From April 2013 onwards, dental services have been commissioned by NHS England, and local authorities took over responsibility for oral health improvement of their communities, including commissioning oral health promotion.

Among the statutory requirements of local authorities is the provision of oral health surveys.

The NHS Outcome Framework 2014/2015

The NHS Outcomes Framework aims to provide a national overview of the NHS performance, provide a mechanism of accountability between the Secretary of State for Health and NHS England and aims to be a mechanism for quality improvement through encouraging change in behaviour and culture, with a clear focus on outcomes rather than processes (Department of Health 2013). One of the indicators relates to patients' experiences of NHS dental services and access to NHS dental services (PHE 2014 (e)).

Public Health Outcomes Framework (2013-16)

The Department of Health Public Health Outcomes Framework for England, 2013-2016 sets out outcome indicators under the 4 domains of; improving the wider determinants of health, Health improvement, Health protection, and Healthcare public health and preventing premature mortality. The framework focuses on the two high level outcomes of increasing healthy life expectancy and reducing differences in life expectancy and healthy life expectancy between communities.

Local authorities achievements, in relation to the indicators are presented on a quarterly basis, and are away of documenting progress for Local Authorities, as well as benchmarking compared to other local Authorities.

The new Public Health Outcomes Framework introduces the overarching vision for public health, supported by an overview of how the indicators are currently being addressed, and an assessment of the impact assessment of this approach.

The framework is focused on the two high level outcomes of

- Increasing healthy life expectancy
- and
- Reducing differences in life expectancy and healthy life expectancy between communities.

It is aligned to the government vision of localism and local government in a key role, working more closely together with public health, to deliver health and wellbeing improvements for its population.

There are a number of Public Health Outcomes that are related to oral health directly, as well as some that can be affected by oral health. The indicators contributing to the above mentioned high level outcomes address elements across the whole live approach. Indicators that are directly influenced by oral health improvement are:

Dental health related indicators:

- * Tooth decay in children age 5

- * Mortality from cancer (this includes oral cancer)

Other indicators that can potentially be influenced by oral health:

- * Pupil absence
- * Sickness absence rates
- * Self-reported wellbeing
- * Health-related quality of life for older people

Indicators with a link to oral health- improving outcomes from these indicators could have positive impact on oral health:

- Children in poverty
- Homelessness
- Breastfeeding
- Smoking (at delivery, smoking prevalence in 15 year olds and adults)
- Diet
- Alcohol (alcohol related admission to hospital/ mortality from liver disease)
- Cancer diagnosed at stage 1 and 2 (in the case of oral cancers)

This highlights the importance of addressing oral health, both for the Local Authority as well as their populations, and makes a case for integrating oral health improvement into other public health related work streams in keeping with a common risk factor approach.

Healthy Lives, Brighter Futures the strategy for children and young people's health

This strategy describes policy recommendations for collaborative working of the NHS, local authorities and other partners to reduce inequalities for children and young people. It highlights that that young people are in better health now, than they used to be in the past, but it also highlights the importance of supporting parents and families further. The strategy proposes using a combination of universal, targeted and specialist services, to meet the needs of families from different population groups.

Fair Society, Healthy Lives

This report presented by Lord Marmot in 2008, is a call for action on health inequalities and lays out a strategy for the government to reduce health inequalities.

It highlights the existence of the social gradient in health and it proposes that in order to address health inequalities, the steepness of the social gradient needs to be addressed, and action is required across all social determinants of health. The strategy introduces the concept of proportionate universalism, universal actions intensified in proportion to the level of disadvantage, to reduce the social gradient and reduce health inequalities.

The report puts forward six policy objectives to achieve the required change as:

- Give every child the best start in life
- Enable all children young people and adults to maximise their capabilities and have control over their lives
- Create fair employment and good work for all
- Ensure healthy standard of living for all
- Create and develop healthy and sustainable places and communities

— Strengthen the role and impact of ill health prevention

The strategy also highlights the importance of empowering individuals and local communities by effective participatory decision-making as a key to a successful local delivery system focused on health equity.

Healthy Lives, Healthy People: our strategy for public health in England

This White paper is the government's response to the Marmot review (summarized above), adopting a life course framework in order to tackle health inequalities through addressing the wider social determinants of health. It puts local government and local communities at the heart of tackling inequalities and improving health and wellbeing, supported by Public Health England.

It makes reference to the transfer of responsibilities in line with the Health and Social Care Act 2012 in transferring the local health improvement functions to local government and giving local government new functions to increase local accountability to support integrated partnership working across social care, NHS and public health.

Transforming participation in health and care

NHS England is mandated to ensure that patients and carers participate in planning, managing and making decisions about their care and treatment as well as having effective public participation in the commissioning processes itself, so that services reflect the needs of local people. Ensuring that patients and the public are engaged in commissioning decisions is thus seen as important, and this oral health needs assessment will aim to capture the voice of local people as part of the process.

Choosing Better Oral Health: an Oral Health Action Plan for England (DoH 2005)

This action plan is aimed at informing and supporting dental practices in their focus towards preventative care and health promotion, alongside the management of oral health conditions. The document clearly lays out the causes of poor oral health as: diet and nutrition, poor oral hygiene, lack of exposure to fluoride, tobacco and alcohol use and dental injuries. As a result, it lays out the key areas for action as increasing access to fluoride, improving diet and reducing sugar intake, encouraging preventative dental care, reducing smoking, increasing early detection of mouth cancer and reducing dental injuries. The document also addresses implications for the dental health workforce and is of interest for commissioners of dental services.

Valuing People's Oral Health: A good practice guide for improving the oral health of disabled children and adults (DoH 2007)

This supplement, following on from the 2005 Choosing Better Oral Health (DoH 2005), aims to influence the provision of oral health programmes and services specifically for children and adults with disabilities. It highlights the importance of assessing local needs through conducting local surveys. It recommends the design and implementation of evidenced preventative actions and programmes in line with the DoH publication: Delivering Better Oral Health: An evidence-based toolkit for prevention). It raises the importance of ensuring consistent messages across health and social care boundaries as well as the integration of oral health in every care plan. It stresses the importance of ensuring treatment services are responsive and needs-led.

Improving oral health and dental outcomes: Developing the dental public health workforce in England (Department of Health, 2010a)

This review aims to support the NHS in England to provide the necessary capacity and capability in dental public health to meet the challenge for the NHS to deliver improved dental services effectively, to address oral health inequalities and to realise the potential for health improvement and disease prevention. The review highlights the shortage of the dental public health workforce in the UK and the importance of ensuring adequate dental public health support to overcome the above mentioned challenges. It puts forward recommendations for the different bodies involved in addressing dental public health needs, and it encourages local authorities to contribute to dental health policy through Local Strategic Partnerships.

Securing Excellence in Commissioning NHS Dental Services (NHS Commissioning board 2013/ Illingworth 2013)

This lays out how NHS Commissioning Boards aim to commission the entire dental pathway as an integrated model of service delivery. Responsibilities of commissioning all dental services (primary, community and secondary care, including dental hospitals and Out of Hours services) lie with NHS England and are commissioned through the NHS Commissioning Board. Clinical Commissioning Groups are responsible for commissioning oral surgery and maxillofacial surgery. The commissioning document lays out the national, regional, as well as area team role in ensuring national frameworks are adapted to meet the local needs.

Oral Health: approaches for local authorities and their partners to improve the oral health of their communities (NICE 2014 PH guidance 55)

In this, the National Institute for Clinical Excellence (NICE 2014) gives 21 recommendations for local authorities to consider improving the oral health of their communities. The recommendations from the NICE guidance are listed below, and are linked to current activities in Northumberland which meet these recommendations, as well as potential actions for the future (table 1). Further on in this oral health needs assessment a more detailed presentation of the current situation in Northumberland in relation to these guidelines can be found.

Recommendation number	Recommendation	Evidence from Northumberland County Council
Recommendation 1	Ensure oral health is a key health and wellbeing priority	Oral health in JSNA
Recommendation 2	Carry out an oral health needs assessment	This document
Recommendation 3	Use a range of data sources to inform the oral health needs assessment	See methodology
Recommendation 4	Develop an oral health strategy	Following on from OHNA
Recommendation 5	Ensure public service environments promote oral health	Better health at work award, Food & Drink
Recommendation 6	Include information and advice on oral health in all local health and wellbeing policies	Not currently, to work on promoting this further
Recommendation 7	Ensure frontline health and social care staff can give advice on the importance of oral health	Health promotion as part of the Health promotion contract commissioned currently aimed at 0-5

		year olds
Recommendation 8	Incorporate oral health promotion in existing services for all children, young people and adults at high risk of poor oral health	Health school award scheme. Health promotion contract to deliver in special needs setting , currently working in specific localities.
Recommendation 9	Commission training for health and social care staff working with children, young people and adults at high risk of poor oral health	Currently not covered specifically as part of Oral Health Promotion service contract
Recommendation 10	Promote oral health in the workplace	Better Health at Work awards
Recommendation 11	Commission tailored oral health promotion services for adults at high risk of poor oral health	Part of Oral Health Promotion service contract for individuals with special needs, but current gap beyond this.
Recommendation 12	Include oral health promotion in specifications for all early years services	Currently not in specifications, but scope to extend this.
Recommendation 13	Ensure all early years services provide oral health information and advice	ChildSmiles awards scheme (but not in all services, only small number)
Recommendation 14	Ensure early years services provide additional tailored information and advice for groups at high risk of poor oral health	In some set ups through Family-Nurse partnership and ChildSmiles
Recommendation 15	Consider supervised tooth brushing schemes for nurseries in areas where children are at high risk of poor oral health	Offered in schools and nursery settings like Josephine Buttler, The Centre,
Recommendation 16	Consider fluoride varnish programmes for nurseries in areas where children are at high risk of poor oral health	Currently not a programme. Varnishes applied by dentists after their individual based risk assessment
Recommendation 17	Raise awareness of the importance of oral health, as part of a 'whole-school' approach in all primary schools	Wellbeing & Health Team , Health Schools Northumberland Award scheme
Recommendation 18	Introduce specific schemes to improve and protect oral health in primary schools in areas where children are at high risk of poor oral health	Offered in referral from Healthy Schools. Some as part of OHP Childsmiles award. Identification through Healthy Schools
Recommendation 19	Consider supervised tooth brushing schemes for primary schools in areas where children are at high risk of poor oral health	Offered in schools and early years settings , not implemented in most

		settings
Recommendation 20	Consider fluoride varnish programmes for primary schools in areas where children are at high risk of poor oral health	Currently not a programme. Varnishes applied by dentists after their individual based risk assessment
Recommendation 21	Promote a 'whole school' approach to oral health in all secondary schools	Healthy Schools Northumberland Award scheme

Table 19: List of NICE recommendations from NICE guidance PH 55, October 2014.

Tackling poor oral health in children. Local government's public health role (LGA 2014)

This guidance, published by the Local Government Associations, lay out the role that local authorities play in oral health improvement, especially for children's oral health.

The report highlights ideas to successfully improve children's oral health and documents some of these by presenting national examples of best practice.

Some of the identified areas of success are:

- Ensure Joint Strategic Needs Assessment (JSNA) considers oral health needs (in line with NICE guidance PH55) and if it demonstrates poor oral health in Children and Young People (CYP) as a significant problem, it should be raised as a priority in Health and Wellbeing Board and in the health and well-being strategy
- To develop a locally tailored oral health strategy
- To promote local leadership and advocacy for oral health improvement
- To work together closely with PHE Consultants in dental health, for support, and as a link to NHS England Area Teams, Local Professional Networks, Health Education England and other partners
- To use the toolkit- commissioning Better Oral Health for CYP to ensure services for children have integrated oral health improvement
- To adopt a life course approach to oral health improvement
- Targeted Universalism to ensure the whole population receives interventions, with additional support for the particular vulnerable groups
- Ensure the views of CYP and families are sought and feed into the commission decisions
- To adopt a joined up partnership approach with full involvement of statutory agencies and council departments , and to consider appointing oral health improvement champions in all of these departments
- Involving schools and early years' settings in supporting oral health improvement and to empower CYP and their carers by promoting self-care and resilience.
- Ensure consistent and evidence based oral health improvement messages
- Consider appointing a senior co-ordinator and a subcommittee, taking responsibility for oral health
- Involve the private sector through schemes like healthy eating awards to adopt a common risk factor approach, that will also benefit oral health

Delivering Better Oral Health: an evidence-based toolkit for prevention (PHE 2014 (f))

With Delivering Better oral health, Public Health England provides a toolkit for evidence based advice and interventions to improve oral health.

It gives advice on oral hygiene practice to reduce the risk of developing caries, as well as periodontal disease. The toolkit highlights the increased risk of periodontitis among diabetic patients through the impact of HbA1c levels and glycaemic control.

Smokefree and Smiling 2nd edition

This document clearly outlines the two directional relationships, between smoking and oral health. It highlights the importance of Tobacco as a major cause of health inequalities, as well as a cause for oral cancer and periodontal diseases. It also presents dental teams as ideally placed to provide very brief advice on tobacco use among their patients. The document highlights further the role of dental teams, commissioners and educators in reducing tobacco use.

The key recommendations for dental teams are ensuring that dental teaching includes tobacco cessation training, meeting national standards, and that dental teams are proactive in engaging tobacco users. Recommendations from this document, that are of potential relevance for local authorities as commissioning bodies, are ensuring support for people using tobacco to help them cease from tobacco use through local stop smoking services. It also recommends that measures are in place, to support the other recommendations put forward. The document provides guidance on:

- the role of dental teams in tobacco cessation
- systems for referring people to local stop smoking services
- undergraduate and postgraduate training standards for dental teams
- current tobacco cessation resources and materials available for dental teams

Oral health for adults in care homes (NICE guidance 48)

The guidance makes recommendations for Health and wellbeing boards, oral health promotion services, as well as care home managers, addressing key elements in ensuring good oral care for adults living in care home settings relevant for the respective groups. It places the responsibilities of ensuring local oral health services address the needs of people in care homes and identifying provision gaps with the health and wellbeing boards. It highlights the importance of oral health promotion to have a specific focus on residents of care homes (NICE 2016).

NHS dental contract reform programme

Dental contract reform programmes are currently under way, to take over from the 2006 primary dental care contract, to support the shift of dental care focus from treatment to prevention. Many challenges have to be addressed to ensure good access to services. Pilots have been conducted that have addressed aspects of the new contracts including care pathways, changes in software, and weighted capitation (BDA 2015 a).

A Prototype has been developed, and the prototype practices are going live from between December 2015- February 2016. Following the evaluation of these prototype sides, a full implementation of the new contract will be developed (BDA 2015 b)

Oral Health promotion in the community

NICE is currently in the process on working on this guidance, which is likely to be a relevant document to help inform commissioning decisions by public health teams in the local authority in fulfilling their mandated responsibilities of oral health promotion for their populations. The guidance is expected to be published in December 2016.

Rapid Review of Healthy Child Programme

This rapid review of the universal public health service for improving the health and wellbeing of children based on the best evidence at the time of its last review in 2009 was conducted in March 2015. It was aimed to review and synthesise the evidence about effectiveness of interventions in the different areas of the programme.

Included in the review is a section on oral health.

The review indicated that strong evidence exists of the benefit of interventions to oral health of young children (0-5).

The review of the literature made the following statements:

- Targeted and timely provision of toothbrushes and fluoride toothpaste reduces tooth decay
- Evidence on the impact on child oral health outcomes from person centred counselling based on motivational interviewing was inconclusive
- There is evidence from one interrupted time-series evaluation that oral health promotion campaigns delivered through multiple venues and targeting several aspects of oral health may be associated with a reduced risk of dental decay in children under the age of five living in deprived communities.
- Supervised tooth-brushing (with fluoride toothpaste) in targeted childhood settings was found to be effective in reducing tooth decay.
- There is evidence from comparison group studies that integrating oral health advice into home visits by health/social care workers, targeted at families at higher risk of oral disease can reduce tooth decay
- The effect of one-off education by dental staff in the general population was limited in relation to clinical outcomes.

The overall statements were around the importance of integrating high quality oral health advice into health programmes, as well as targeting high-risk families in order to achieve best outcomes

Appendix 2

Northumberland mapped against NICE guidance:

The National Institute for Clinical Excellence (NICE), in their Oral health guidance; approaches for local authorities and their partners to improve the oral health of their communities (NICE 2014 /PH 55), gives 21 recommendations for local authorities to consider to improve the oral health of their communities. The recommendations from the NICE guidance are listed below and are linked to current activity in Northumberland to meet these recommendations, as well as potentials for the future. Below the table, is a more detailed presentation, of the current situation in Northumberland

in relation to these guidelines, also allowing considerations of how these recommendations could be addressed in the future.

	Recommendation	Evidence from Northumberland County Council
Recommendation 1	Ensure oral health is a key health and wellbeing priority	Oral health in JSNA
Recommendation 2	Carry out an oral health needs assessment	This document
Recommendation 3	Use a range of data sources to inform the oral health needs assessment	Oral health needs assessment
Recommendation 4	Develop an oral health strategy	Following on from OHNA
Recommendation 5	Ensure public service environments promote oral health	Better health at work award, Food & Drink policies
Recommendation 6	Include information and advice on oral health in all local health and wellbeing policies	Not currently: to work on promoting this further
Recommendation 7	Ensure frontline health and social care staff can give advice on the importance of oral health	Health promotion as part of the Health promotion contract commissioned currently aimed at 0-5 year olds
Recommendation 8	Incorporate oral health promotion in existing services for all children, young people and adults at high risk of poor oral health	Healthy school award scheme. Health promotion contract to deliver in special needs setting , currently working in specific localities.
Recommendation 9	Commission training for health and social care staff working with children, young people and adults at high risk of poor oral health	Currently not covered specifically as part of Oral Health Promotion service contract
Recommendation 10	Promote oral health in the workplace	Better Health at Work awards
Recommendation 11	Commission tailored oral health promotion services for adults at high risk of poor oral health	Part of Oral Health Promotion service contract for individuals with special needs, but current gap beyond
Recommendation 12	Include oral health promotion in specifications for all early years services	Currently not in specifications, but scope to extend this
Recommendation 13	Ensure all early years services provide oral health information and advice	ChildSmiles awards scheme (but not in all services, only small number)
Recommendation 14	Ensure early years services provide additional tailored information and advice for groups at high risk of poor oral health	In some set ups through Family-Nurse partnership and ChildSmiles
Recommendation 15	Consider supervised tooth brushing schemes for	Offered in schools and

	nurseries in areas where children are at high risk of poor oral health	nursery settings, The Centre, Josephine Butler Primary Campus.
Recommendation 16	Consider fluoride varnish programmes for nurseries in areas where children are at high risk of poor oral health	Currently not a programme. Varnishes applied by dentists after their individual based risk assessment
Recommendation 17	Raise awareness of the importance of oral health, as part of a 'whole-school' approach in all primary schools	Wellbeing & Health Team , Health Schools Northumberland Award scheme
Recommendation 18	Introduce specific schemes to improve and protect oral health in primary schools in areas where children are at high risk of poor oral health	Offered in referral from Healthy Schools. Some as part of OHP Childsmiles award. Identification through Healthy Schools
Recommendation 19	Consider supervised tooth brushing schemes for primary schools in areas where children are at high risk of poor oral health	Offered in some schools and early years settings, not implemented in most settings
Recommendation 20	Consider fluoride varnish programmes for primary schools in areas where children are at high risk of poor oral health	Currently not a programme. Varnishes applied by dentists after their individual based risk assessment
Recommendation 21	Promote a 'whole school' approach to oral health in all secondary schools	Healthy Schools Northumberland Award scheme

Table 20: List of Nice recommendations from NICE guidance 55, October 2014.

Recommendation 1: Ensure oral health is a key health and wellbeing priority

- *Make oral health a core component of the joint strategic needs assessment and the health and wellbeing strategy. Review it as part of the yearly update.*
- *Set up a group that has responsibility for an oral health needs assessment and strategy. Ensure the following contribute to the work of the group:*

a consultant in dental public health

a local authority public health representative

an NHS England commissioner of local dental services

a representative from a local professional dental network

a representative from the local dental committee

representatives from children and adult social care services

a local Healthwatch representative

a senior local government representative to lead on, and act as an advocate for, oral health

representatives from relevant community groups.

Oral health has been identified as a key health and wellbeing issues, and is addressed in the most recent Joint Strategic Needs Assessment (JSNA) conducted by Public Health in Northumberland County Council. The recognition of the importance of oral health has also lead to the conduction of this oral health needs assessment. The oral health needs Assessment will be presented at the Health and Wellbeing board and thus commence a discussion of oral health at this level as well.

The presented oral health needs assessment was completed as a “desktop” exercise and, even though, no formal oral health needs assessment group was convened for the process, the above mentioned representatives were involved in a one to one bases, and asked to contribute to the oral health needs assessment. The oral health needs assessment was shared with them for comments, before it was presented to Health and Wellbeing group.

Recommendation 2: Carry out an oral health needs assessment

The group responsible for the oral health needs assessment and strategy (see recommendation 1) should:

Define the scope of an oral health needs assessment for the local population. This should include:

What the assessment will and will not cover, for example, access to services for groups at high risk of poor oral health, certain age groups or in certain settings (see recommendation 3).

The responsibilities of each partner organisation and how they will work together to make best use of resources (for example, detailing how data could be collected across organisations).

The need to consider recommendations and outcomes from any previous oral health needs assessment (if available).

Ensure the oral health needs assessment is an integral part of the joint strategic needs assessment and clearly linked to strategies on general health and wellbeing (see recommendation 1).

Conduct the oral health needs assessment as part of a cyclical planning process geared towards improving oral health and reducing health inequalities. It should not be a one-off exercise that simply describes the target population.

The presented Oral Health Needs Assessment is the first step to identify current population needs in relation to oral health in Northumberland. It is aimed to provide a snapshot of the current level of knowledge around oral health of the population as well as the current provision in Northumberland. This first step identifies a number of areas for potential further exploration, and this will be addressed through the oral health strategy moving forward. The majority of data included in this oral health needs assessment was secondary data, derived from routinely collected information. The only data that was collected as part of the oral health needs assessment, was the information collected as part of the residents' engagement process. The need to collect further information will be reviewed, and might be one of the next steps. As highlighted in the recommendation by NICE above, an oral health needs assessment should be a cyclical planning process, rather than a one-off exercise. This is why it was felt a useful opportunity, to get an overview of the existing data and to consider further data collection following this, to inform further cycles of the oral health needs assessment process.

Recommendation 3: Use a range of data sources to inform the oral health needs assessment

The group responsible for the oral health needs assessment and strategy should:

Use local demographic and deprivation profiles to identify groups that may be at high risk of poor oral health.

Use national surveys of oral health (adult and child) and NHS dental epidemiological programme data to gain an idea of local oral health needs relative to the national picture and comparator areas.

Use national demographic and socioeconomic data and the established link between these factors and oral disease to determine likely local needs.

Use local expertise and local health and lifestyle surveys and consultations to understand local oral health needs in the context of general health.

Consider seeking advice on survey design and the collection, analysis and interpretation of epidemiological data relevant to oral health.

The presented oral health needs assessment used a range of data sources to obtain a picture of the oral health related needs and assets influencing the oral health of residents in Northumberland.

Recommendation 4: Develop an oral health strategy

The group responsible for the oral health needs assessment and strategy (see recommendation 1) should:

Develop an oral health strategy based on an oral health needs assessment (see recommendations 2 and 3). This should set out how the local authority and its health and wellbeing commissioning partners will:

Address the oral health needs of the local population as a whole (universal approaches).

Address the oral health needs of groups at high risk of poor oral health (targeted approaches).

Address any oral health inequalities within the local population and between the local population and the rest of England.

Identify and work in partnership with people who are in a position to improve oral health in their communities. This includes those working in adult, children and young people's services, education and health services and community groups.

Set a good example through their own policies and the policies of organisations they commission to provide services. For example, by ensuring access to free drinking water in all workplaces and public areas and through healthy catering and food policies (see recommendations 5 and 6).

Set out the additional support that people working with groups at high risk of poor oral health will be given, including training or resources. (See the NICE guideline on community engagement.)

Get all frontline staff in health, children and adult services to use every opportunity to promote oral health and to emphasise its links with general health and wellbeing.

Ensure easy access to services to help prevent oral disease occurring in the first place and to prevent it worsening or recurring for everyone, throughout their lives.

Evaluate what works for whom, when and in what circumstances.

Monitor and evaluate the effect of the local oral health improvement strategy as a whole.

Following on from this oral health needs Assessment, an oral health strategy is planned to be developed, based on the recommendations from this Oral Health Needs Assessment.

Recommendation 5: Ensure public service environments promote oral health

Local authorities and other commissioners and providers of public services should:

Ensure all public services promote oral health by:

Making plain drinking water available for free.

Providing a choice of sugar-free food, drinks (water or milk) and snacks (including fresh fruit), including from any vending machines on site (see the NICE guidelines on obesity and obesity: working with local communities)

Encouraging and supporting breastfeeding (see the NICE guideline on maternal and child nutrition).

This includes services based in premises wholly or partly owned, hired or funded by the public sector such as: leisure centres; community or drop-in centres; nurseries and children's centres; other early years services (including services provided during pregnancy and for new parents); schools; and food banks.

Review other 'levers' that local authorities can use to address oral health and the wider social determinants of health, for example, local planning decisions for fast food outlets (see recommendation 11 in the NICE guideline on prevention of cardiovascular disease).

Explore the possibility of linking with local organisations in other sectors (for example, local shops and supermarkets) to promote oral health. This could be part of a broader approach to promoting healthier lifestyles including helping people to reduce their tobacco and alcohol consumption.

Some of this work has been started in Northumberland through the Food and Drinks strategy and the Better health at work awards. This is a first step only, and further work is required to ensure a more widespread consistent approach of creating health, and oral health, promoting environments in all public service environments across the county.

Recommendation 6: Include information and advice on oral health in all local health and wellbeing policies

Local authorities and other commissioners and providers of public services should:

Ensure all health and wellbeing and disease prevention policies for adults, children and young people (including local government health and social care policies and strategies) include advice and information about oral health. This should be based on the 'advice for patients' in Delivering better oral health. It should be included with information about the common risk factors for ill health.

Ensure health and wellbeing and disease prevention policies for children and young people cover oral health. For example, this may include policies covering:

nutrition, including breastfeeding and weaning practices (see the NICE guideline on maternal and child nutrition)

nutrition and the health and wellbeing of looked after babies, children and young people (including care leavers) (see the NICE guideline on looked-after children and young people)

obesity (see the NICE guidelines on obesity and obesity: working with local communities)

local food, drink and snacks policies in a range of settings, including nurseries and children's centres

private and voluntary providers of childcare services (including childminding services)

primary and secondary education (see recommendations 17 to 21)

local child and young person safeguarding policies

care delivered at home

providers of care services offered to children and young people in their own home.

Ensure health and wellbeing and disease prevention policies for adults cover oral health. For example, this may include policies covering:

health and social care assessments

nutrition and health and wellbeing

care delivered at home

local food, drink and snacks policies in a range of settings, including drop-in centres, lunch clubs, leisure centres and food banks

local adult safeguarding policies

carer centres

providers of adult care services offered in someone's own home.

This is an area that will be highlighted as part of the recommendations of this oral health needs assessment. There is definite scope, to increase information and advice on oral health in local health and wellbeing policies. It is envisaged, that oral health can be addressed in all health and wellbeing policies as appropriate, when they are reviewed, or a new policy is developed.

Recommendation 7: Ensure frontline health and social care staff can give advice on the importance of oral health

Local authorities and other commissioners and providers of public services should:

Ensure service specifications include the requirement for frontline health and social care staff to receive training in promoting oral health. This should include:

the 'advice for patients' in Delivering better oral health

the fact that tooth decay and gum disease are preventable

the importance of regular tooth brushing

links between dietary habits and tooth decay

how fluoride can help prevent tooth decay

links between poor oral health and alcohol and tobacco use including the use of smokeless tobacco.

where to get advice about local dental services, including costs and transport links

Ensure staff understand the links between health inequalities and oral health and the needs of groups at high risk of poor oral health.

As part of the current Oral Health Promotion Contract, training on oral health advice is given to frontline health and social care staff for early years and 0-5 provisions, as well as in setting of care or education for people with special needs and elderly population. However, these are currently only in small numbers and dependent on the interest of individual providers to ensure staff is attending training. As many providers are private, and not funded by the local authority, it will be a challenge, to ensure that all frontline health and social care staff are trained to provide adequate advice on oral health.

There are also elements of this as part of the Childsmiles award schemes, and care home award schemes. There is therefore scope to extend this, within the existing contract, but also to support this, by mandating staff to be trained in oral health, as part of the contracts with these organisations. Award schemes could be used to facilitate this, in areas, where contracting and procurement do not come from the local authority. Ensuring that all frontline staff is trained, to deliver oral health promotion, could also mean a shift of the current oral health promotion service, towards a provision that mainly provides training. Moving towards an adoption of this recommendation might require a review of the currently commissioned service, to ensure that the service commissioned is the most efficient way of improving oral health across Northumberland and ensures oral health promotion is fully integrated into all health and social care services, enabling all frontline staff to address oral health related aspects.

Recommendation 8: Incorporate oral health promotion in existing services for all children, young people and adults at high risk of poor oral health

Commissioners of health and social care services, including those that support people to live independently in their own home, should:

Review all community health and social care service specifications to ensure oral health is included in care plans and is in line with safeguarding policies.

Ensure service specifications include a requirement to promote and protect oral health in the context of overall health and wellbeing. Relevant services include substance misuse services and those supporting people living independently in the community. (For example, people who are homeless or living in hostels, those who experience physical or mobility problems, people with learning difficulties, and people experiencing mental health problems.)

Ensure service specifications include:

an assessment of oral health, including a referral, or advice to go to a dentist or other clinical services (this may be because of pain, concerns about appearance or difficulty in eating)

making oral health care, including regular dental check-ups, an integral part of care planning – through self-care or clinical services

support to help people maintain good oral hygiene (including advice about diet)

staff training in how to promote oral health – during inductions and then updated on a regular basis (see recommendations 7 and 9).

This recommendation is currently not fully implemented in Northumberland. There are links to some oral health promotion activities in some of the service specification. For care homes, oral health promotion is not covered in service specifications, however there is a system of quality standards in place, with some of the quality standards relating to oral health promotion. Compliance with standards leads to an increase in payment for the care home, thus incentivising compliance with these standards.

More work needs to be done, to ensure that oral health promotion is an integral part of all service specifications for all services for children, young people and adults at high risk of poor oral health.

Recommendation 9: Commission training for health and social care staff working with children, young people and adults at high risk of poor oral health

Local authorities and health and wellbeing commissioning partners should:

Commission regular, training for frontline health and social care staff working with groups at high risk of poor oral health. This should be based on 'advice for patients' in Delivering better oral health. The aim is to ensure they can meet the needs of adults, children and young people in groups at high risk of poor oral health. The training should include:

Basic assessment and care planning to promote and protect oral health.

How good oral health contributes to people's overall health and wellbeing.

The consequences of poor oral health, for example, dental pain and infection. (This can exacerbate symptoms associated with dementia and can also contribute to malnutrition among older people.)

How the appearance of teeth contributes to self-esteem.

Causes, symptoms and how to prevent tooth decay (including root caries in older people), gum disease and oral cancer, for example:

the role of plaque in gum disease and how it can affect the immunity of people with diabetes

the role of high-sugar diets

the link between the use of sugar-sweetened methadone and poor oral health

smoking and other tobacco products as a risk factor for oral diseases such as gum disease and oral cancer (see the NICE guideline on smokeless tobacco cessation).

Techniques for helping people maintain good oral hygiene (including the use of fluoride toothpaste).

Local pathways for accessing routine, urgent and home care and specialist services.

How to encourage and support people to register with a dentist and how to act as an advocate to ensure others can use services.

Entitlements to free dental treatment or help with costs.

Information on local voluntary sector organisations that may be able to offer additional advice, help or advocacy services.

What advice to give to carers.

As part of the current oral health promotion contract, oral health promotion activities are aimed at those in health and social care working with children, young people and adults at high risk of poor oral health. This is mainly aimed at those working with adults and children with special needs, people living in care homes as well as with children under 5 years of age. To fully meet this recommendation, the oral health promotion will need to be extended and also address some other high risk groups, as suggested in the guidance recommendation.

Recommendation 10: Promote oral health in the workplace

Public sector employers including local authorities and the NHS should:

Work with occupational health and human resource services to promote and protect oral health using the 'advice for patients' in Delivering better oral health. This should be part of efforts to improve general health and wellbeing at work and should be tailored to local needs. (See the NICE pathway on smoking cessation in the workplace and the NICE guideline on preventing type 2 diabetes: population and community-level interventions.)

Consider ways to raise awareness of evidence-based oral health information and advice and ways to improve access to dental services, for example, by giving people information about local advocacy services.

Consider allowing people time off work to go to the dentist without losing pay (as is common practice for GP appointments).

Make information available to staff about local dental services and about national guidelines on oral health. For example, include this information at health promotion events, in leaflets and posters and on noticeboards and the intranet. This information should be written in plain English and should include details of:

the links between diet, alcohol and tobacco use and oral health

effective oral hygiene techniques, including the use of fluoride products and tooth brushing techniques

the benefits of going to the dentist and regular check-ups

eligibility for reduced-cost or free treatment

how to obtain appropriate forms (for example, for people receiving certain benefits, including pregnancy and maternity benefits)

local advocacy services

Ensure the workplace environment promotes oral health (see recommendation 6).

Northumberland County Council, through the Public Health team, signed up to the national smile month campaign (16th of May-16th of June 2016) and used this as an opportunity to raise the profile of oral health with employers.

This is the first step in ongoing work around this, as the importance of oral health, not just for the individual employee, but also for the organisation as a whole is recognised. Improved oral health will benefit the individuals oral health related quality of life, and increase their health and wellbeing. For the organisation improving oral health can reduce the negative impact from employee absenteeism, but also presenteeism⁵⁷. The impact on the economy from work absences was estimated in the range of £36.6 million in 2012, and a nationwide survey conducted by the British Dental Health Foundation in 2012, estimated 415,000 employees taking time off work as a result of dental problems, and 1.1 million people taking time off work to look to care for their child, as a result of oral health related issues⁵⁸

Recommendation 11: Commission tailored oral health promotion services for adults at high risk of poor oral health

Local authorities, health and wellbeing commissioning partners and NHS England area teams should:

Use information from their oral health needs assessment to identify local areas and groups at high risk of poor oral health (see recommendation 2)

Provide tailored interventions to help people at high risk of poor oral health who live independently in the community. This could include outreach services, for example, for people who are homeless or who frequently change location, such as traveller communities. Ensure services deliver evidence-based advice in line with the 'advice for patients' in Delivering better oral health.

Ensure services promote and protect oral health, for example, by:

giving demonstrations of how to clean teeth and use other oral health and hygiene techniques (as appropriate)

promoting the use of fluoride toothpaste

⁵⁷ Presenteeism, is the practice, of coming to work, in spite of an issue related to the individual's health or wellbeing, associated with reduced productivity in the time the individual is present at work.

⁵⁸ <https://www.dentalhealth.org/news/details/719>

providing free or discounted materials including fluoride toothpaste and manual and electric toothbrushes

explaining the links between oral health and diet, alcohol and tobacco use.

Ensure local care pathways encourage people to use dental services.

As with the other recommendations, some of this is currently being done in Northumberland, but to fully address this recommendation, this area needs to be extended further.

Recommendation 12: Include oral health promotion in specifications for all early years services

Local authorities and health and wellbeing commissioning partners should:

Ensure all contract specifications for early years services include a requirement to promote oral health and train staff in oral health promotion (see recommendations 7 to 9 and 13 to 14). This includes services delivered by:

Midwives and health visiting teams.

Early years services, children's centres and nurseries.

Child care services (including childminding services).

Frontline health and social care practitioners working with families who may be at high risk of poor oral health. (For example, families with complex needs, teenage parents and families from minority ethnic communities where poor oral health is prevalent and people may find it difficult to use services.)

Ensure all frontline staff in early years services, including education and health, receive training at their induction and at regular intervals, so they can understand and apply the principles and practices that promote oral health.

This is currently not fully addressed and it is recommended that this area is addressed in the service specification and redesign of children's services moving forward.

Recommendation 13: Ensure all early years services provide oral health information and advice

Local authorities and health and wellbeing commissioning partners should:

Ensure all early years services include advice about oral health in information provided on health, wellbeing, diet, nutrition and parenting. This should be in line with the 'advice for patients' in Delivering better oral health. If possible, oral health activities such as tooth brushing should be listed with other general routines recommended for children by established parenting programmes (such as Parenting UK).

Ensure all frontline staff can help parents, carers and other family members understand how good oral health contributes to children's overall health, wellbeing and development. For example, by:

promoting breastfeeding and healthy weaning, including how to move from breast or bottle feeding to using an open cup by 12 months (see box 1)

promoting food, snacks (for example, fresh fruit) and drinks (water and milk) that are part of a healthier diet

explaining that tooth decay is a preventable disease and how fluoride can help prevent it

promoting the use of fluoride toothpaste as soon as teeth come through (see Delivering better oral health for appropriate concentrations)

encouraging people to regularly visit the dentist from when a child gets their first tooth

giving a practical demonstration of how to achieve and maintain good oral hygiene and encouraging tooth brushing from an early age

advising on alternatives to sugary foods, drinks and snacks as pacifiers and treats

using sugar-free medicine

giving details of how to access routine and emergency dental services

explaining who is entitled to free dental treatment

encouraging and supporting families to register with a dentist

providing details of local advocacy services if needed.

Recommendation 14: Ensure early years services provide additional tailored information and advice for groups at high risk of poor oral health

Local authorities and health and wellbeing commissioning partners should:

Use information from the oral health needs assessment to identify areas and groups where children are at high risk of poor oral health (see recommendation 2).

Provide tailored services to meet the oral health needs of these groups (this includes young children who are not attending nursery).

Ensure early years services identify and work in partnership with relevant local community organisations (see recommendation 1) to develop and deliver tailored oral health advice and information for families (See the NICE guideline on community engagement).

Ensure health and social care practitioners can provide culturally appropriate advice and information on oral health for families with babies and young children.

Consider giving midwives and health visitor's free tooth brushing packs to offer to families in groups at high risk of poor oral health. (See Childsmile for an example of these packs.)

Distribution of packs should be combined with information on when and how to brush teeth, a practical demonstration and information about local dental services.

Recommendation 15: Consider supervised tooth brushing schemes for nurseries in areas where children are at high risk of poor oral health

Local authorities and health and wellbeing commissioning partners should:

Use information from the oral health needs assessment to identify areas where children are at high risk of poor oral health (see recommendation 2).

Consider commissioning a supervised tooth brushing scheme for early years settings (including children's centres) in these areas. The scheme should include:

arrangements for getting informed consent from parents or carers

supervised daily tooth brushing with fluoride toothpaste on the premises

collaborative working with parents or carers to encourage tooth brushing both at home and at the nursery

providing free toothbrushes and fluoride toothpaste (1 set to use on the premises and 1 set to take home)

a designated lead person for the scheme at all establishments

access to a dental professional for advice if needed

support and training for staff to deliver the scheme (this should be recorded and monitored)

performance monitoring at least once every school term (that is, at least 3 times a year), against a checklist drawn up and agreed with the group responsible for the local oral health needs assessment and strategy (see recommendations 1 and 4).

Feedback from the Oral Health promotion lead indicates that Infection and control messages passed on, but that often there is a feeling that tooth-brushing is not the responsibility of nursery settings.

Recommendation 16: Consider fluoride varnish programmes for nurseries in areas where children

Local authorities and health and wellbeing commissioning partners should:

Use information from the oral health needs assessment to identify areas where children are at high risk of poor oral health (see recommendation 2).

If a supervised tooth brushing scheme is not feasible (see recommendation 15), consider commissioning a community-based fluoride varnish programme for nurseries as part of early years services for children aged 3 years and older. The programme should provide at least 2 applications of fluoride varnish a year.

Ensure early years services work in collaboration with parents and carers to gain parental consent for as many children as possible to take part in the fluoride varnish programme.

Ensure families of children who do not visit the dentist regularly are encouraged and helped to use dental services.

Monitor uptake and seek parental feedback on the fluoride varnish scheme.

If resources are available, consider commissioning both a supervised tooth brushing scheme and a fluoride varnish programme. are at high risk of poor oral health

Recommendation 17: Raise awareness of the importance of oral health, as part of a 'whole-school' approach in all primary schools

Local authorities (where they have a role in the governance of a school), school governors and head teachers should:

Promote a 'whole-school' approach to oral health by:

Ensuring, wherever possible, that all school policies and procedures promote and protect oral health (for example, policies on diet and nutrition, health and safety and anti-bullying should include oral health; see Standards for school food in England, Department for Education 2014).

Making plain drinking water available for free and encouraging children to bring refillable water bottles to school.

Providing a choice of sugar-free food, drinks (water and milk) and snacks (for example, fresh fruit). These should also be provided in any vending machines.

Displaying and promoting evidence-based, age-appropriate oral health information for parents, carers and children (this should be relevant to local needs and include details of how to access local dental services).

Ensuring opportunities are found in the curriculum to teach the importance of maintaining good oral health and highlighting how it links with appearance and self-esteem. This should use age-appropriate information, adapted to meet local needs and based on the 'advice for patients' in Delivering better oral health.

Identifying and linking with relevant local partners to promote oral health (see the NICE guideline on community engagement). This could include oral health promotion schemes commissioned by the local authority and local community networks (see recommendation 3).

List of settings having achieved or retained the Northumbria Childsmiles Award in 2014-15

Northumbria Childsmiles Award-Achieved	Northumbria Childsmiles Award-retained
Alnwick Children's Centre	Stakeford First School
Widdrington First School	Seaton Valley Children's Centre
Cramlington West Children's Centre	Ashington Children's Centre
Cramlington Village Children's Centre	Choppington Children's Centre
Cramlington East Children's Centre	Morpeth Children's Centre
Lynemouth Children's Centre	Bedlington Children's Centre
Wooler Children's Centre	Ellington First School Nursery
Seahouses Children's Centre	Blyth West Children's Centre Nursery
Bedlington Stead Lane Primary School	Blyth Central 's Centre
Bellingham North Tynies Children's Centre	Coquet Children's Centre
Ponteland Children's Centre	Pegswood Children's Centre
Albermarle Barracks	Berwick Children's Centre
Hexham Children's Centre	Prudhoe Children's Centre
Amble Children's Centre	Western Tynedale Children's Centre
Ashington Children's Centre	Rothbury Children's Centre
Choppington First School	
Newbiggin Children's Centre	

Recommendation 18: Introduce specific schemes to improve and protect oral health in primary schools in areas where children are at high risk of poor oral health

Local authorities (where they have a role in the governance of a school), school governors and head teachers should:

Use information from the oral health needs assessment to identify areas where children are at high risk of poor oral health (see recommendation 2).

Ensure primary schools in these areas, identify school staff who could be trained to provide advice and support to promote and protect pupils' oral health. Train these staff to give:

age-appropriate information adapted to meet local needs and based on the 'advice for patients' in Delivering better oral health

advice and information about where to get routine and emergency dental treatment, including advice about costs (for example, transport costs)

advice and help to access local community networks offering information, advice and support about general child health and development.

Ensure trained staff set up and run tooth brushing schemes and support fluoride varnish programmes commissioned by local authorities (see recommendations 19 and 20).

Provide opportunities for staff to talk with parents or carers about, and involve them in, improving their children's oral health. For example, opportunities might arise at parent-teacher evenings, open days or by encouraging parents and carers to get involved in developing the school food and drinks policy.

Recommendation 19: Consider supervised tooth brushing schemes for primary schools in areas where children are at high risk of poor oral health

Local authorities and health and wellbeing commissioning partners should:

Use information from the oral health needs assessment to identify local areas where children are at high risk of poor oral health (see recommendation 2).

Consider commissioning a supervised tooth brushing scheme for primary schools in these areas (for details of these schemes see recommendation 15). If resources are limited, prioritise reception and year 1 (up to age 7).

Recommendation 20: Consider fluoride varnish programmes for primary schools in areas where children are at high risk of poor oral health

Local authorities and health and wellbeing commissioning partners should:

Use information from the oral health needs assessment to identify areas where children are at high risk of poor oral health (see recommendation 2).

If a supervised tooth brushing scheme is not feasible (see recommendation 15), consider commissioning a community-based fluoride varnish programme for primary schools. This should provide at least 2 applications of fluoride varnish a year (see recommendation 16).

Consider commissioning both a supervised tooth brushing scheme and a fluoride varnish programme, if resources are available.

Recommendation 21: Promote a 'whole school' approach to oral health in all secondary schools

Local authorities (where they have a role in the governance of a school), school governors and head teachers should:

Promote a 'whole-school' approach to oral health by:

Ensuring, wherever possible, that all school policies and procedures promote and protect oral health (for example, policies on diet and nutrition, health and safety and anti-bullying).

Making plain drinking water available free and encouraging children to bring refillable water bottles to school.

Providing a choice of sugar-free food, drinks (water and milk) and snacks (including fresh fruit). These should also be provided in any vending machines.

Ensuring opportunities are found in the curriculum to teach the importance of maintaining good oral health and highlighting how it links with appearance and self-esteem. This should use age-appropriate information, adapted to meet local needs and based on 'advice for patients' in Delivering better oral health.

Ensure school nursing services encourage good oral health, including effective tooth brushing, use of fluoride toothpaste and regular dental check-ups.

Ensure all school leavers know where to get advice and help about oral health, including dental treatment and help with costs. They should be provided with details of relevant services, including links to local community networks.

In areas where children and young people are at high risk of poor oral health consider identifying and training secondary school staff to advise on dental issues (see recommendation 7). This includes giving advice about dental treatment and costs, and promoting oral health among students (for example, by explaining the links between diet, alcohol, tobacco, sexual practices and oral health).

Work with local authorities to influence planning decisions on new buildings (for example, to ensure drinking fountains are installed) and fast food outlets (for example, ice cream vans, burger vans and shops).

Appendix 3

Population and Demographics

Northumberland is England's most northern County. Most of Northumberland's land border is with Scotland. Nearly all (97 %) of Northumberland is classed as rural with a number of bigger towns like Hexham, Morpeth, Alnwick, Ashington on the coast and Berwick on the Scottish border. Some of the population live in areas that are considered the remotest areas in England – 7 Lower Layer Super Output Areas (LSOAs⁵⁹) in the county have a population density of less than 10 people per km². Northumberland is a largely rural population, with 70.8% of the population living rurally (including hub towns) (DEFRA 2015).

The general population of Northumberland is 315,806 in an area comprising 5,013km², leading to a sparse population density of 63 people per km².

⁵⁹ LSOAs were defined to aid small area statistics, and LSOAs are a geographical area that include a population size of between 1,000- 3,000.

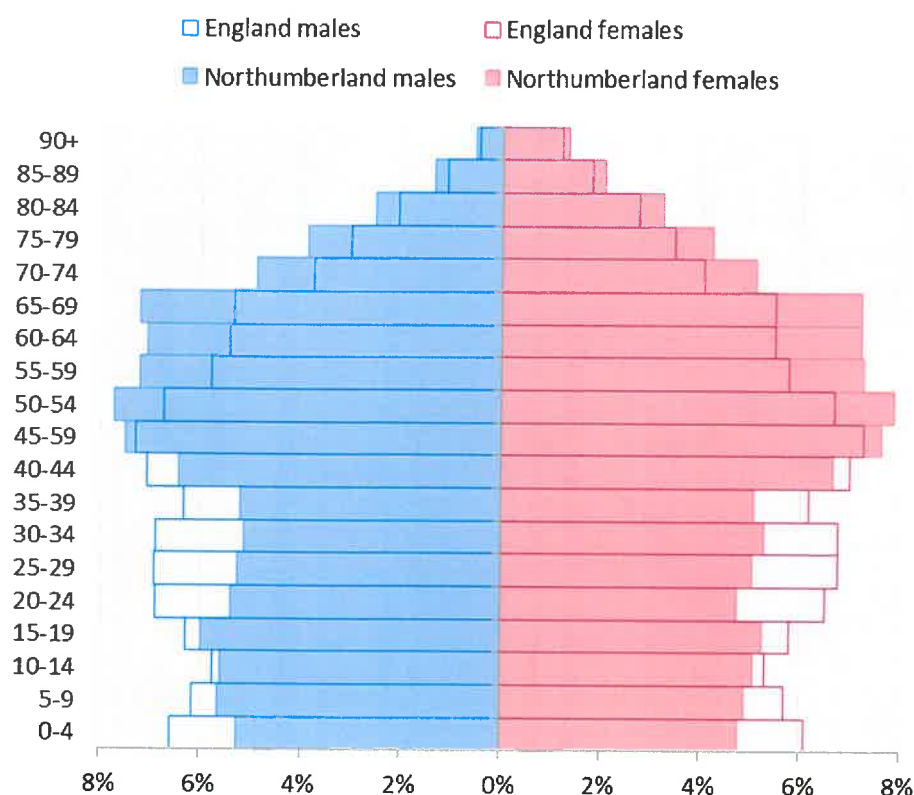


Figure 33: Population structure of Northumberland compared to England (Data source: ONS mid-2014 population estimates)

Household density in 2011 was 28 households per km^2 . (England /Wales average: 155 households per km^2)⁶⁰.

The age distribution in Northumberland differs to that of the England population with an increase in the population of individuals aged over 45 years and most significantly in the age groups above 55 years of age. As Figure 2 shows, there is an increase in the number of people aged 65 years and over compared to the England average (increase by 4.5%). This increase comes at the cost of the younger populations, particularly the under 25 year olds (4.2% less compared to England average for those aged under 16 years as well as for the 16-24 year olds. Life expectancy for men, 79.2 years, is similar to the England average, but life expectancy for women, 82.5 years, is slightly, but statistically significantly, below the England average. (PHE data, Health Profile 2015)

The population in Northumberland is characterized through little ethnic diversity, with 97.2% of the population being classed as "White British". In the 2011 census, only 2.8 % of the Northumberland population classed themselves as not "White UK" (in England as a whole this was 20.2% of the population). The percentage of Northumberland Black and Minority Ethnic (BME) residents was only 1.6% (England average 14.6%). Figure 3 shows the distribution of BME population across Northumberland. The population that cannot speak English well or at all is low, with only 0.2% (England overall: 1.7%).

⁶⁰ ONS data, taken from: <http://www.northumberland.gov.uk/default.aspx?page=15753>.

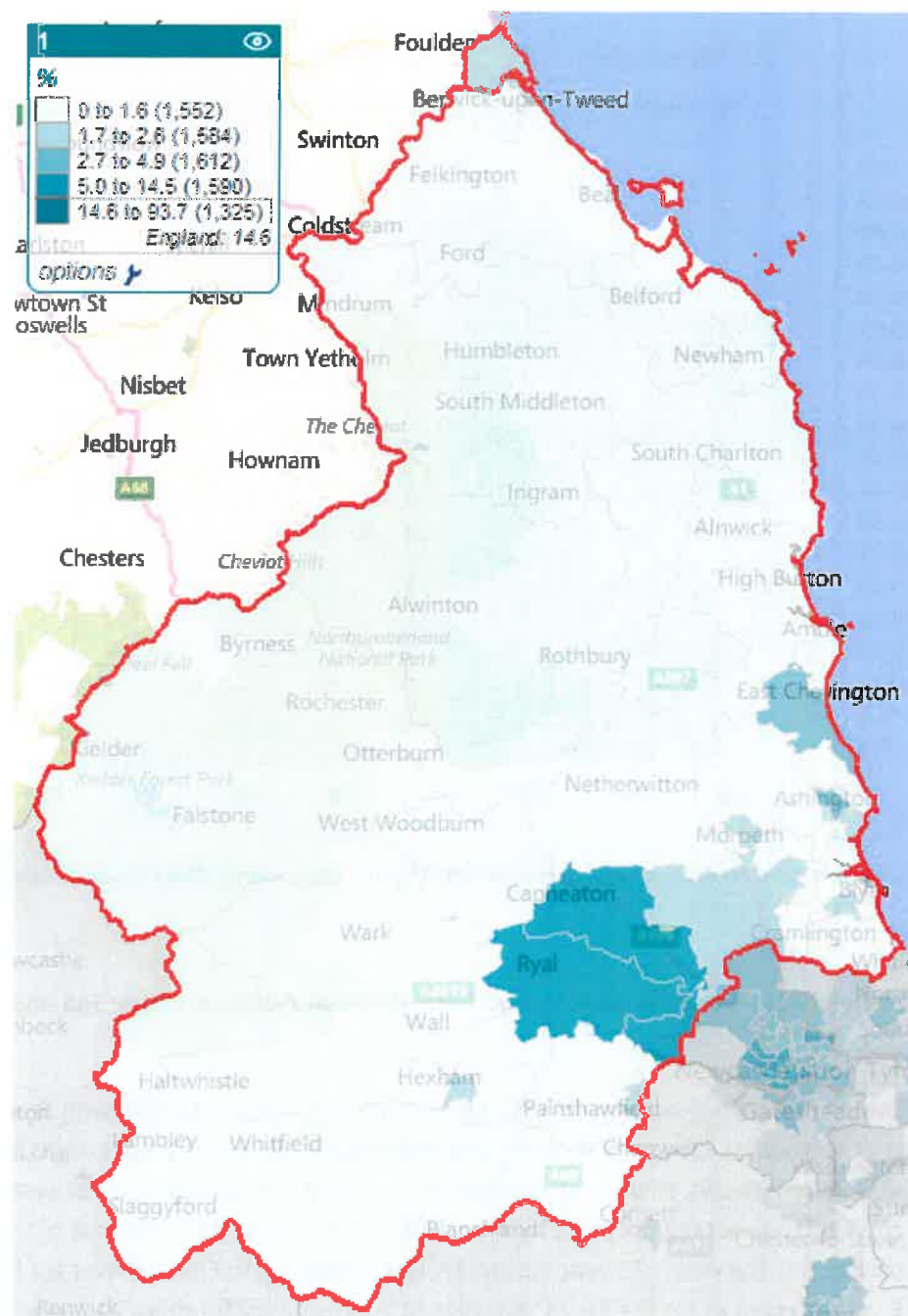


Figure 34: Distribution of BME population in Northumberland, by ward (Data source: 2011 Census)

Northumberland has 66 electoral wards. The boundaries of these wards last changed following the council elections in May 2013. A map of the current wards can be found in the appendix (Appendix 2). At the time of the 2011 census, Northumberland still had 67 wards.

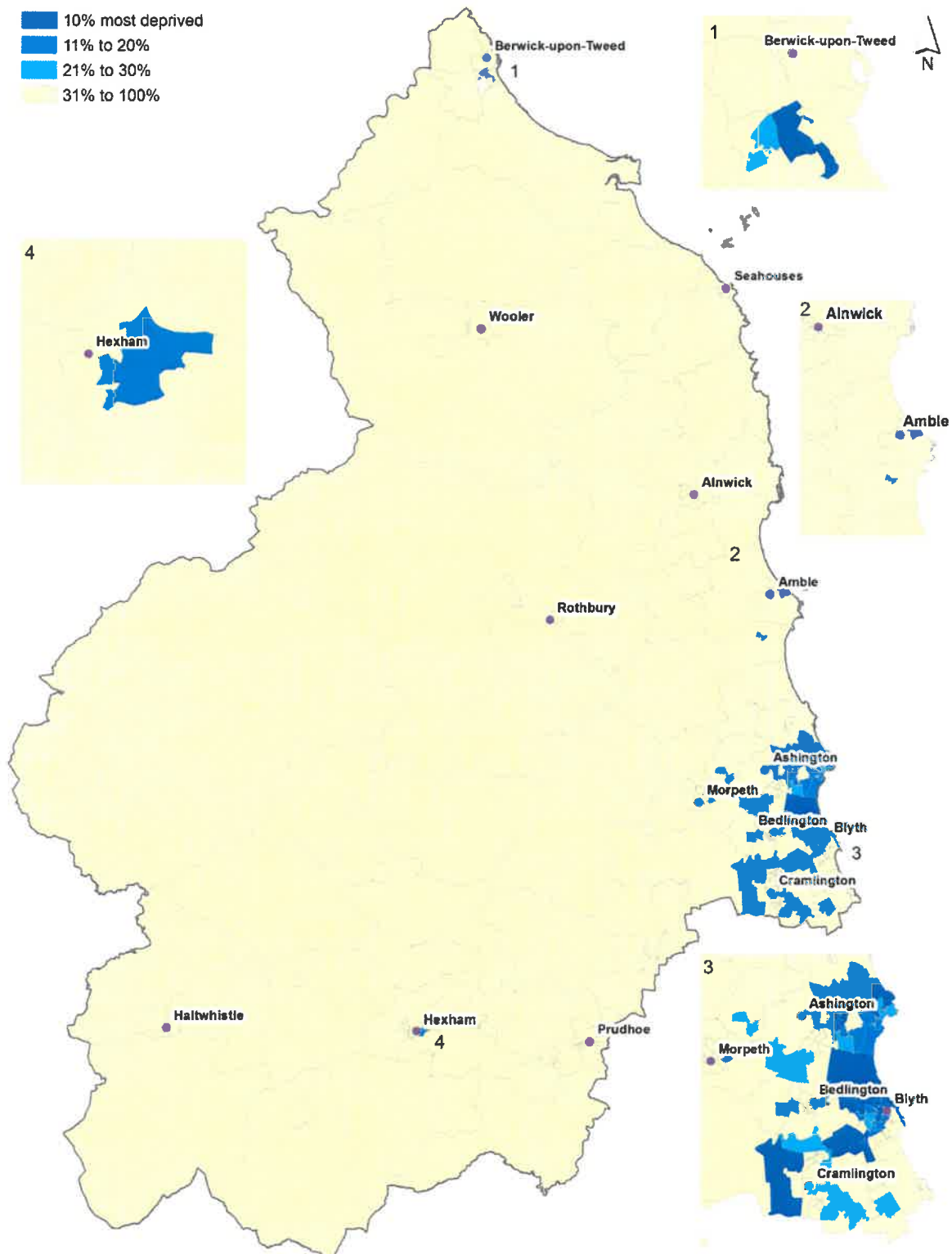
Despite Northumberland having lower overall levels of deprivation, compared to England as a whole, there are pockets of high deprivation, with some areas having as many as 45.6 % of children living in child poverty (Newbiggin Central & East) and 28.1 % of the population with income deprivation (Kitty Brewster), more than double the national average.

The new data on deprivation, published in September 2015 showed some of the Lower Super Output Areas (LSOA) in Northumberland to be among the 10% most deprived in the country. For example; 14 LSOAs in Northumberland are among the 10% most deprived in the country according to the Index of Multiple Deprivation (IMD); 22 LSOAs are among the 10% most deprived in the country according to the Income Deprivation Affecting Children Index (IDACI); and 3 LSOAs are among the 10% most deprived in the country for the Income Deprivation Affecting Older People Index (IDAOPI).

Figures 4 shows the distribution of areas with higher Deprivation across Northumberland. This highlights that the highest levels of deprivation are found on the South East coast, and around Berwick in the North.

Northumberland has significantly higher hospital attendance and admission rates for children, when compared to England, as well as significantly worse adult lifestyle indicators, including healthy eating.⁶¹

⁶¹ Full Health Profiles: www.apho.org.uk/resource/item.aspx?RID=171627.



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Figure 35: Map of the most deprived areas for the 2015 Income Deprivation Affecting Children Index (IDACI) (Source: Northumberland Knowledge Research Report, 2015)

People with long-term illness or disability

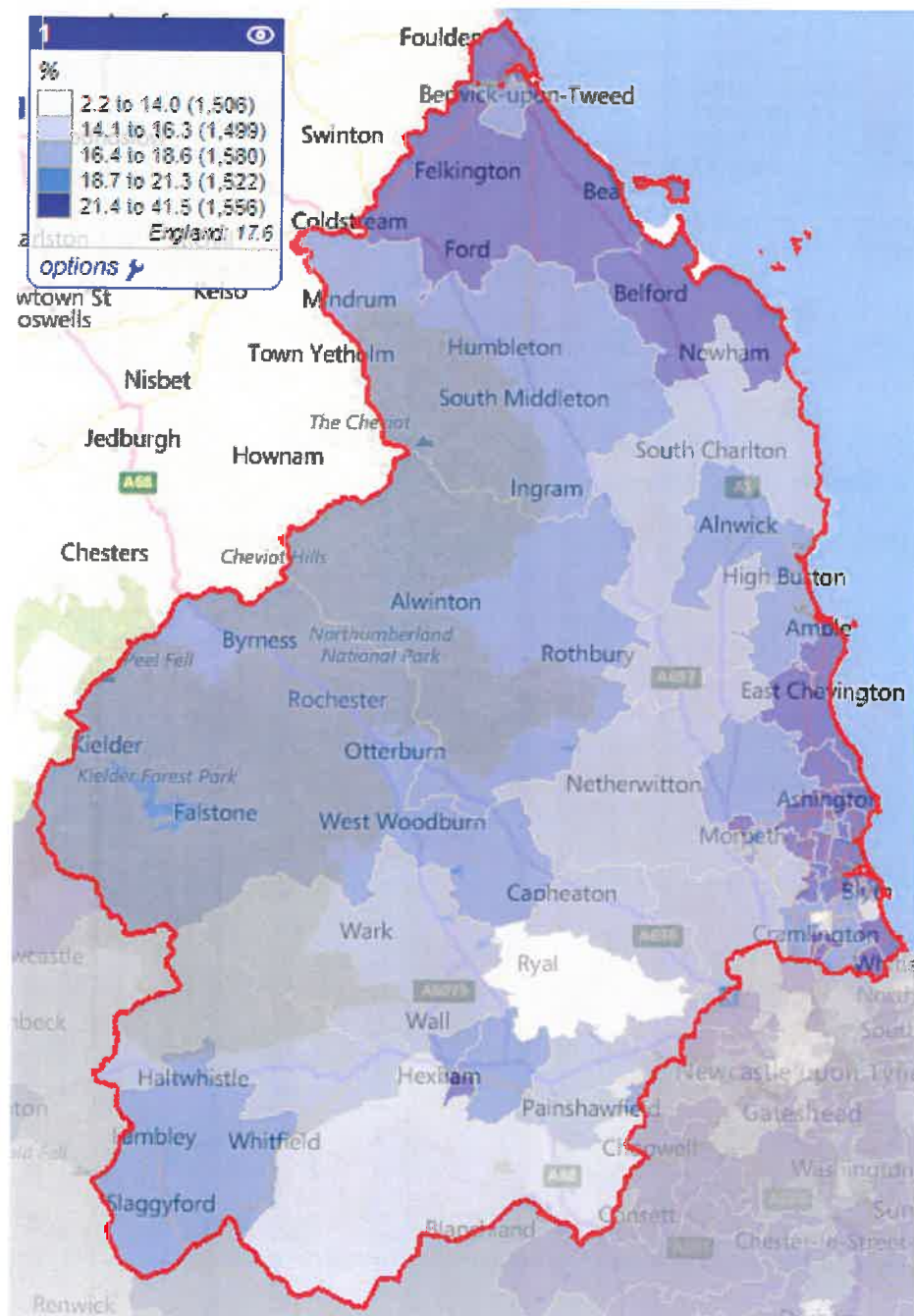


Figure 36: Proportion of people in Northumberland reporting a limiting long-term illness or disability, by ward (Data source: 2011 Census)

General health

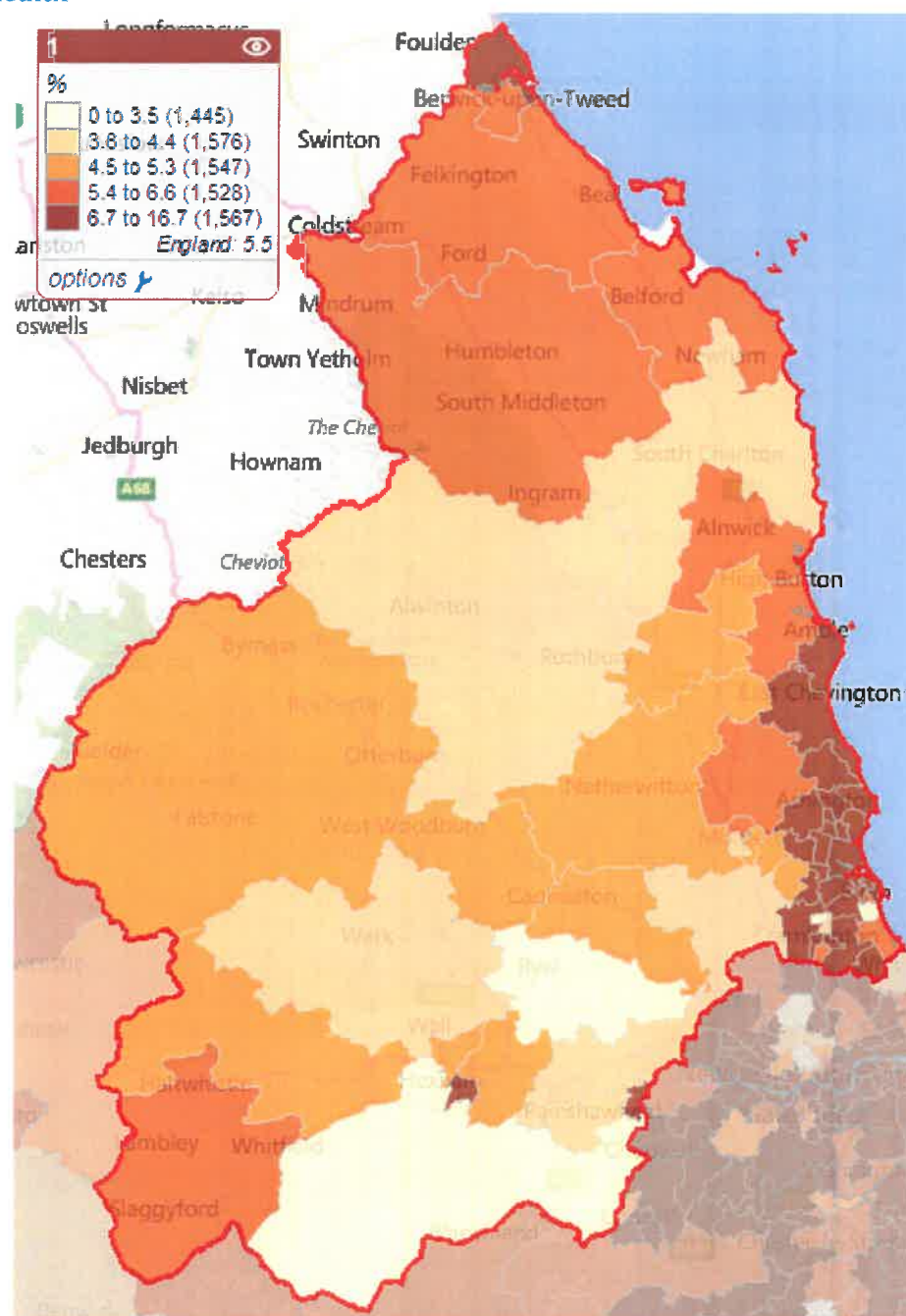
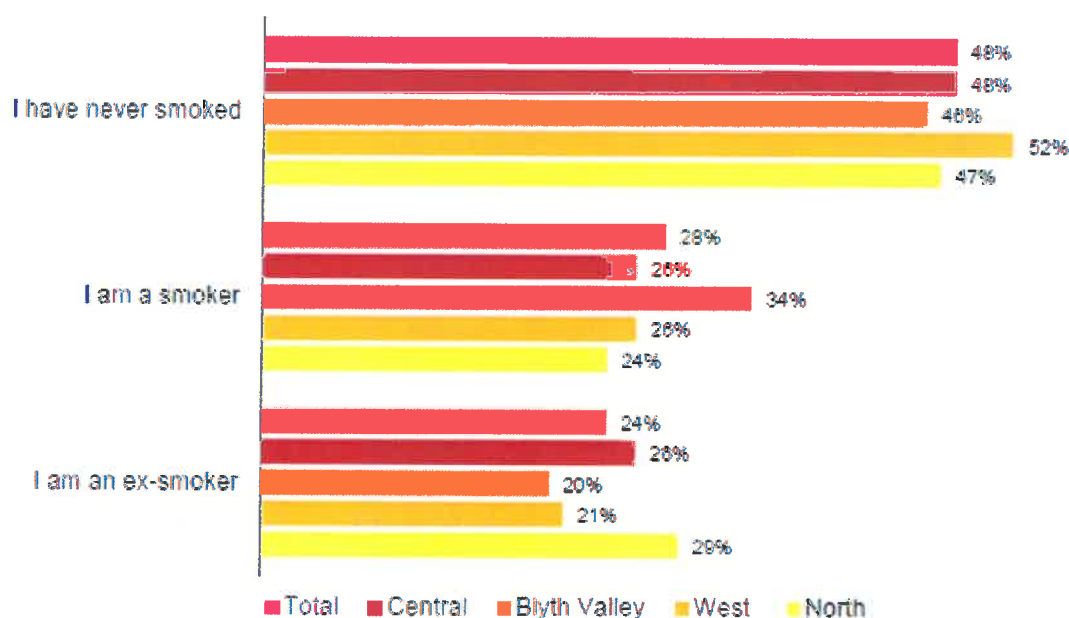


Figure 37: % of people in Northumberland reporting bad or very bad health, by ward (Data source: 2011 Census)

Smoking

Overall smoking prevalence among adults is similar to the England average; however smoking related deaths are higher in Northumberland, than the England average (Health profile 2015)⁶². The distribution of smoking prevalence mirrors the distributions of deprivation, with the highest rates of smokers and lowest rates of people having never smoked, in the Blyth Valley area of the county (figure 7).

⁶² www.apho.org.uk/resource/item.aspx?RID=171627



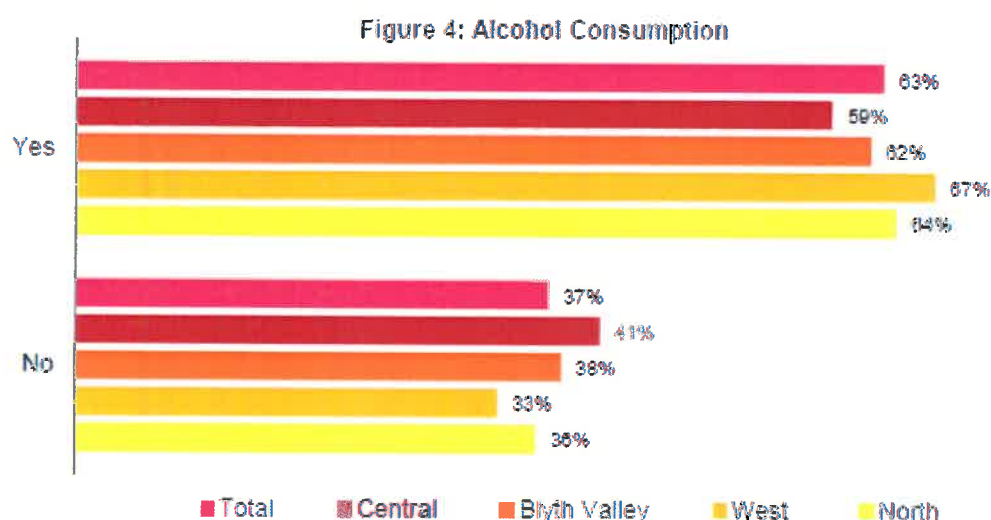
Q1. Which of the following best describes you?

Base: All respondents - 3,323 (Central - 900, Blyth Valley - 862, West - 803, North - 758)

Figure 38: Smoking status of Northumberland residents (Source: Northumberland Lifestyle Survey Research Report, 2014)

Alcohol

Rates of Hospital stays for alcohol related harm is significantly worse in Northumberland than the England average. In keeping with the distribution of levels of deprivation, and poor general health, alcohol related health problems are not evenly distributed across the county with the highest rates found in the coastal South-East (Figure 8&9).



Q2. Do you ever drink alcohol?

Base: All respondents - 3,323 (Central - 900, Blyth Valley - 862, West - 803, North - 758)

Figure 39: Alcohol consumption in Northumberland (Source: Northumberland Lifestyle Survey Research Report, 2014)

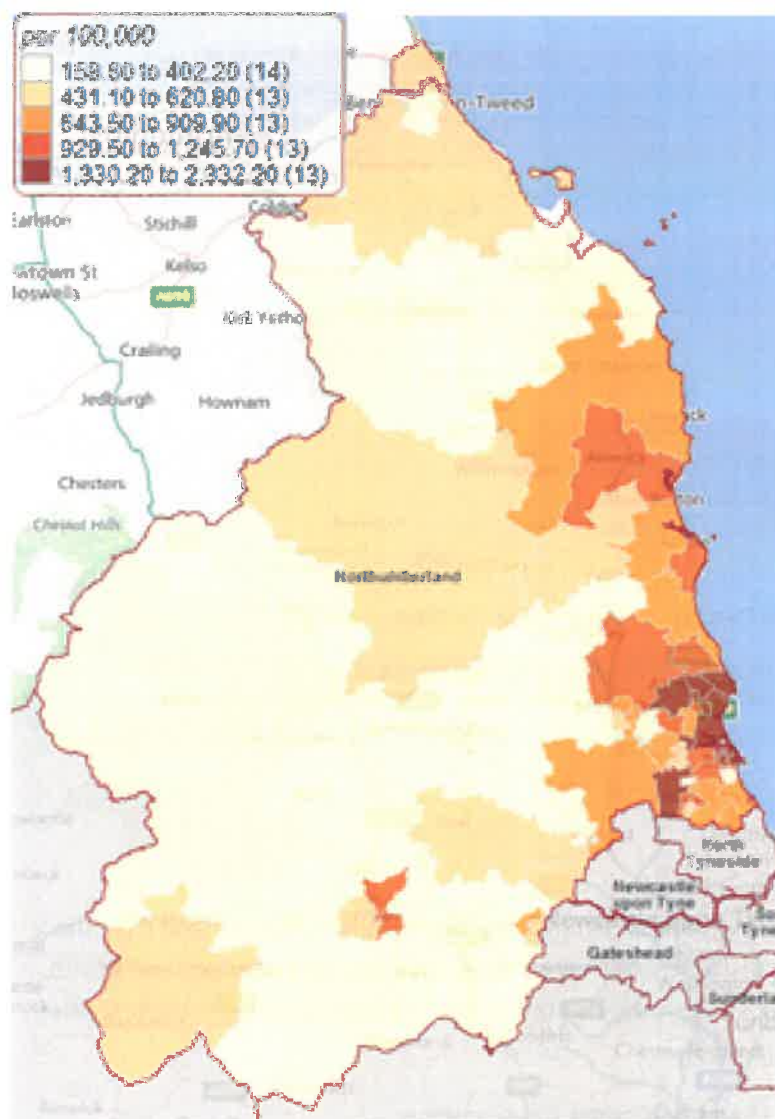


Figure 40: Hospital admissions wholly attributed to alcohol April – November 2013(Data source: Public Health Team, Northumberland Council)

Appendix 4

Information on variation of dental decay among 5 year olds on ward level

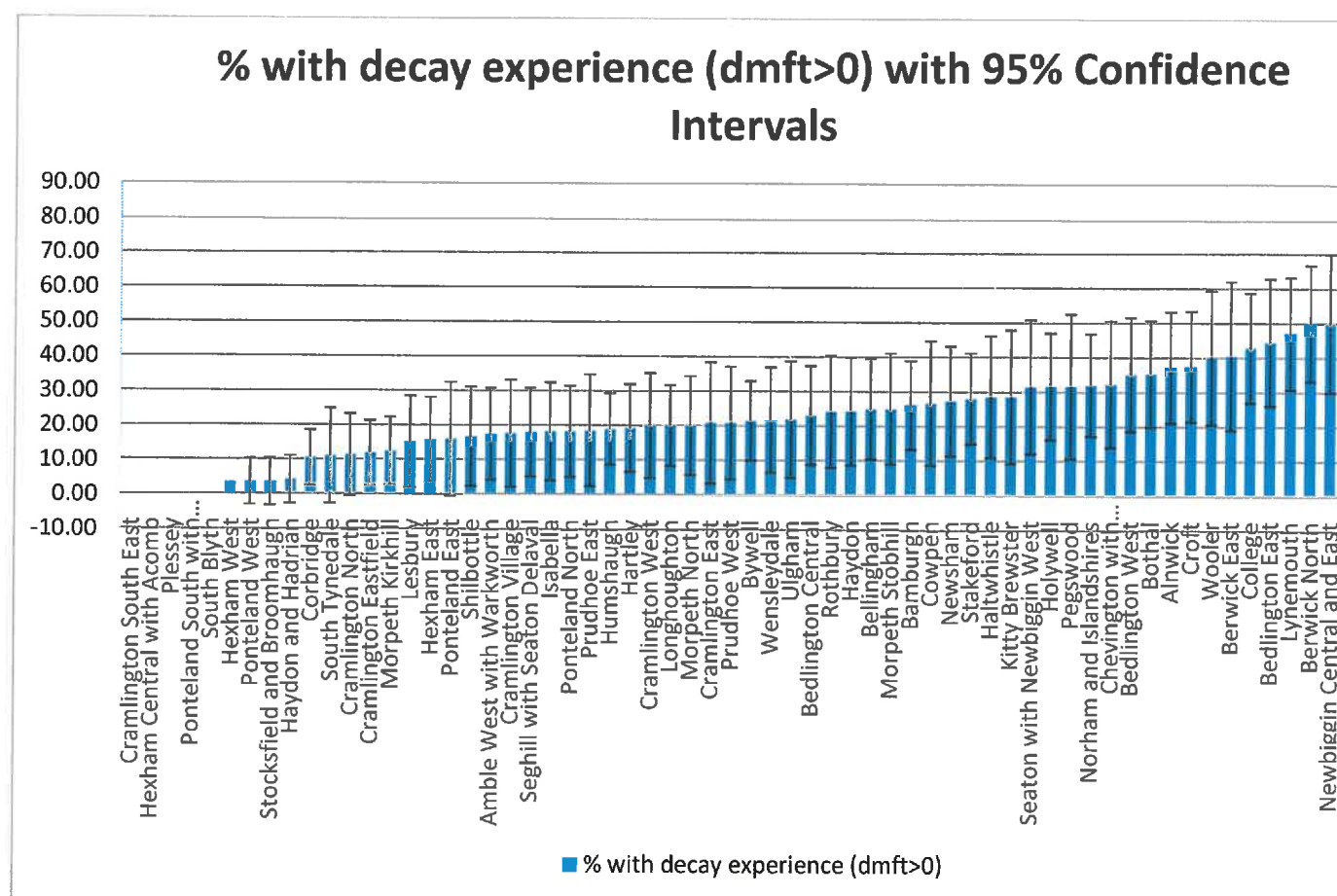


Figure 41: showing % of 5 year olds with dental decay in 2012 per ward. 95% Confidence intervals are presented (PHE data)

The prevalence of children aged 5 years old with decay experience, as presented in Figure 10 needs to be reviewed with caution. As is demonstrated through the large 95% confidence intervals, the sample size in each of the wards was small, ranging between 3-54 children examined. The findings therefore are just a gross indication of decay prevalence. The small sample size and the recruitment process of participants lead to a risk of bias in the above presented results. This highlights an important issue in relation to the quality of available information on dental decay of adults and children.

In Northumberland, the uptake of examination among the children invited to take part in the survey was 67% in 2007/2008 and 70.5% in 2011/2012. However, it is also worth noting, that the percentage of children examined out of the overall population in this age group in Northumberland, was only 6.9% in 2011/2012 and 57.8% in 2007/08. This means that the numbers, especially of the 2011/2012 survey for Northumberland, are very small and the numbers for Northumberland are therefore less likely to represent the actual prevalence of dental decay across the county, especially for the more recent figures from the 2011/2012 survey.

Appendix 5

Notes on methodological considerations for the dental health survey

It is of note that methodology of the dental survey for both 5 year olds, as well as 12 year olds has changed since 2006; previously, negative consent by parents informed of the survey allowed for children to participate in the survey, but from May 2006, parents have to sign a consent form to allow the participation of their children (NICE 2014 guidance 55). It has been shown, that this change in methodology has the potential for increasing the risk of a bias of the survey result in favour of less dental decay, and means that caution need to be practiced when comparing the results of more recent surveys to those from before 2006. A study by Davies et al., in 2011, showed that reduced rates of participation, as a result of positive consent, lead to reduced levels of dental decay reported by the survey, showing that those with dental decay, or at increased risk of dental decay had a higher rate of not participating in the survey, thus leading to a selection bias in favour of children without dental decay (Davies 2011). Dyer et al. also demonstrated lower rates of dental decay under positive consent compared to negative consent, especially in areas of higher deprivation in Bradford and Airedale (Dyer 2008). This change in the consent requirement therefore poses a major impact on the quality of available data on dental decay, and this has implications when trying to use dental survey data in informing decisions in relation to delivering interventions and services aimed at improving the dental health of populations.

There was also a variation of the sample size in Northumberland between the last three surveys of 5 year olds conducted. In 2007/08 there were 181 children aged 5 years (out of total population of 5 year olds 3.146) included in the survey. In the next survey (2011/2012), there were 1927 children aged 5 years (out of total population of 5 year olds 3.334) included, and the most recent survey (2014/15) represents the oral health of 290 children age 5 years (out of total population of 5 year olds of 3.271). The variation in sample size could have some impact on the results, with a smaller sample size being less reliable, and influenced more by outlying results. The large reduction in dental decay prevalence between 2007/08 to 2011/12 could appear larger, as the sample size in 2007/08 was smaller, and could have thus over-estimated the real prevalence of dental decay, among 5 year olds in Northumberland. The results from the 2011/21 survey are based on a larger sample size, representing 57.8% of the population of 5 year olds and are thus more representative of the population estimate.

The findings of the national survey of dental health of 5 year olds is useful in obtaining a picture of dental decay across the different areas of England, bearing in mind some caveats when using its findings.

Appendix 6:

Age-standardised registration rates of cancers per 100,000 population

Site	gender	England	North East	North West	Yorkshire and Humberside	East Midlands	West Midlands	East of England	London	South East	South West
Neoplasm of lip, oral cavity & pharynx	m	19.6	22.1	24.6	21.6	16.9	19.0	18.5	19.1	17.1	18.9
	f	8.9	10.2	9.7	9.8	9.2	8.1	8.4	9.3	8.4	8.2
Neoplasm of the lip	m	0.7	u	0.9	1.3	0.5 u	0.7 u	1.0	u	0.6	0.5u
	f	0.2	u	u	0.8	u	u	0.4u	u	u	u
Neoplasm of the base of the tongue	m	2.5	3.1	2.8	2.3	2.4	2.5	2.6	2.3	2.2	2.9
	f	0.6	0.8 u	1.0	0.4 u	0.4 u	0.7 u	0.7	0.4 u	0.5	0.8
Neoplasm of other unspecified parts of the tongue	m	3.3	3.3	4.5	3.7	2.3	3.1	3.4	3.2	3.2	2.7
	f	2.0	2.1	2.3	1.9	2.2	1.7	1.7	2.2	2.2	1.9
Neoplasm of the gum	m	0.9	0.8	0.9	0.7u	1.1	0.7 u	0.8	1.0	0.8	1.1
	f	0.7	u	0.6	0.7u	0.7	0.7	0.8	1.0	0.6	0.5u
Neoplasm of the floor of the mouth	m	1.3	1.5 u	2.0	1.8	1.2	1.3	0.9	1.3	1.1	0.9
	f	0.5	u	0.6	0.8	0.6 u	0.7u	0.5u	0.4u	0.4u	0.5
Neoplasm of the palate	m	1.0	1.1u	1.2	1.3	1.0	0.7u	1.0	1.1	0.7	1.0
	f	0.7	0.8u	0.6	0.7u	0.8 u	0.7u	0.5u	0.7	0.6	0.6
Neoplasm of other and unspecified parts of the mouth	m	1.2	1.7u	1.6	1.2	1.2	1.0	1.0	1.7	1.0	0.8
	f	1.0	1.3u	1.2	1.0	0.8	0.6u	1.1	1.2	0.9	0.7
Neoplasm of the oropharynx	m	0.8	0.8u	1.1	1.1	0.7 u	0.7 u	0.5 u	1.1	0.5	0.7 u
	f	0.2	u	u	0.4 u	u	u	u	u	u	u

Table 21: Directly age-standardised registration rates of cancers per 100,000 populations of newly diagnosed cases of cancer, registered by May 2015 (source: ONS⁶³)

⁶³ Available from

<https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/datalist?filter=datasets>

Appendix 7:

Fluoride varnish application in Northumberland

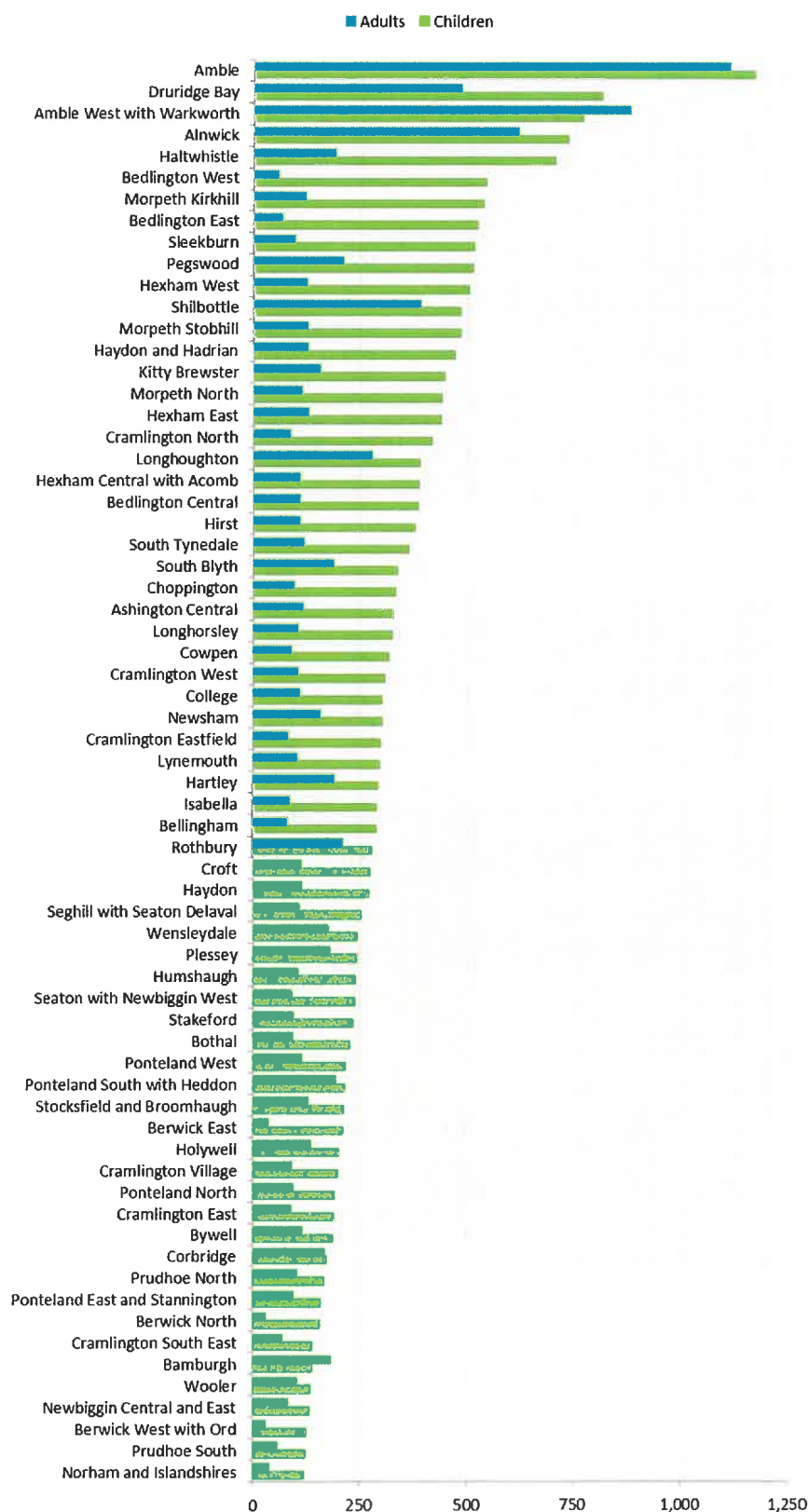


Figure 42: Total claims with Fluoride varnish in children and adults by wards across Northumberland for the years 2011/2012 and 2012/2013. Data from PHE

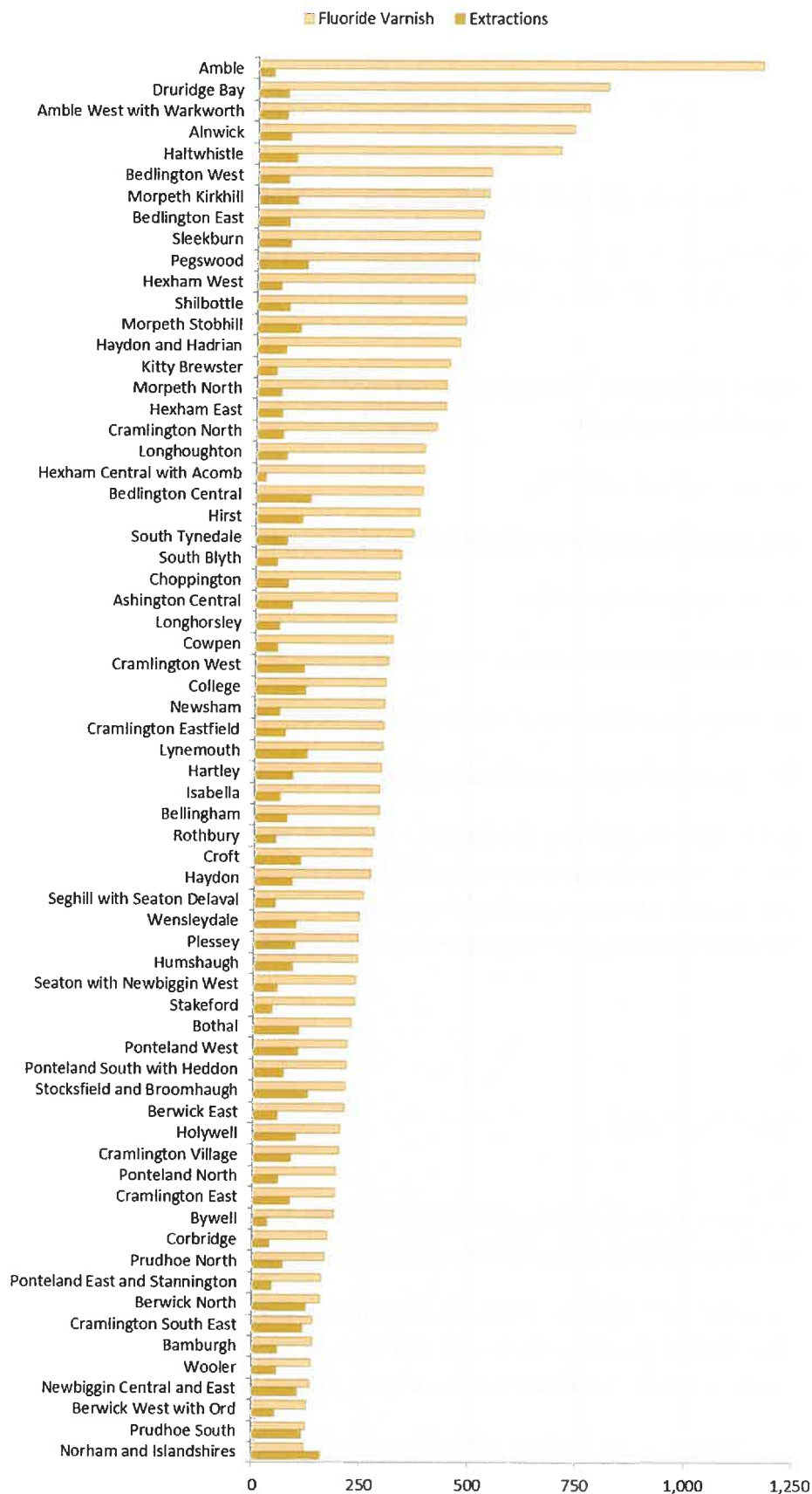


Figure 43: number of claims with fluoride varnish and dental extraction in children 2012/2014 (PHE data)

Appendix 8

Questions relating to NHS dentistry in the annual GP survey:

Q46: When did you last try to get an NHS dental appointment for yourself?

Answer options: in the last 3 months, between 3a and 6 months ago, between 6 months and a year ago, between 1 and 2 years ago, more than 2 years ago, I have never tried to get an NHS dental appointment

Q47: last time you tried to get an NHS dental appointment, was it with a dental practice you had been to before for NHS dental care?

Answer options: yes, no, can't remember

Q48: Were you successful in getting an NHS dental appointment

Answer options: yes, no, can't remember

Q49: Overall how would you describe your experience of NHS dental services?

Answer options: Very good, Fairly good, Neither good nor poor, fairly poor, very poor)

Q50: Why haven't you tried to get an NHS dental appointment in the last two years?

Answer options: I haven't needed to visit a dentist, I no longer have any natural teeth, I haven't had time to visit a dentist, I don't like going to the dentist, I didn't think I could get an NHS dentist, I am on a waiting list for an NHS dentist, I stayed with my dentist when they changed from NHS to private, I prefer to go to a private dentist, NHS dental care is too expensive, another reason

Appendix 9:

Topical fluoride application

Fluoride varnish

Fluoride varnishes are a form of topical application of fluoride. It is used as a targeted preventative intervention, provided by the dentist to individuals assessed at high risk of developing dental decay.

Fluoride varnishes can be an effective element in preventative approaches to reducing dental decay, having been shown to have the potential to reducing decay in primary dentition by 33 %, and in permanent dentition, by 46% (PHE 2015(c)) when applied every 6 months.

Fluoride varnish is applied by the dentist or dental hygienist at an appointment. Public Health Advisory Committee (PHAC) agreed that fluoride varnish was not a solution to poor oral health, and if

a decision between fluoride varnish programmes or tooth brushing schemes was to be made, they would advise in favour of tooth brushing schemes, as they do not only expose teeth to fluoride, but also establish life-long good oral hygiene practices (NICE 2014, guidance 55).

In Northumberland there were 22,288 claims for Fluoride varnish application in children, and 10,590 in adults in 2012/2014. A presentation of the application of fluoride varnishes for children and adults by ward across Northumberland can be found in Appendix 6 of this document (Appendix 7)

When looking at the number of claims including fluoride varnishes and those including dental extraction for children by ward of residence, some of the wards with high levels of dental decay among 5 year olds, have low numbers of dental extractions and high numbers of claims with fluoride varnish. Some wards with lower levels of fluoride varnish application have proportionately higher rates of dental extraction in children (Appendix 7). However, the recommendations are for fluoride varnish to be applied every 6 months, and the data presented here reflects the number of varnishes applied, but not the number of children receiving this treatment, nor the percentage of children receiving fluoride varnishes out of those who could benefit from this intervention. The data suggests that there is a good uptake of preventative care and dentists are applying more numbers of fluoride varnishes, than performing dental extractions on children, however, the data does not allow the determination as to whether the application of fluoride varnishes reaches the children at greatest need. As there is no financial incentive for the data collection by dentists, the quality of the recorded data needs to also be considered when interpreting the data.

Community fluoride varnish schemes

Fluoride varnishes can be used in preventative oral health improvement programmes outside of dental appointments, as it is currently being done as part of the Childsmile programme in Scotland.

Childsmiles is a national programme implemented in Scotland in 2005 as a response to poor dental health in children. It consists of different components, a universal component (Childsmile Core) aimed at promoting daily tooth brushing in all nurseries (and including free distribution of toothbrushes and fluoridated toothpaste) with an additional targeted element aimed at children living in areas of deprivation (Childsmile Nursery). The third component of Childsmile are the Childsmile practices, aimed to increase access to dental practices.

In the Childsmile nursery element of the Childsmile programmes, fluoride varnishes are offered twice a year in nurseries and schools for children aged three or over and in Childsmile practices from the age of 2 years. The dose used is 0.25 mls of Duraphat (5.6 mg of fluoride) in children under 6, and 0.4mls (8.96 mg of fluoride) in older children. The fluoride varnish is offered to children twice a year in their school or nursery, and twice a year through their Childsmiles practice. Thus children attending Childsmile practices regularly will receive up to 4 fluoride varnishes per year.

The programme has been heralded as a great success resulting in an increase of children at primary 1 level without obvious decay experience by 14 % (from 54% to 68% from 2006-2014) and increasing access to NHS dentists to 92% of Scottish children now registered with a dentists. It is said to be saving almost £5 million a year in treatment costs in Scotland⁶⁴.

⁶⁴ from BBC website: <http://www.bbc.co.uk/news/uk-scotland-33052270>

The Childsmiles programme in Scotland has been designed as a programme to improve oral health in children in Scotland as well as reducing health inequalities (both in dental health, as well as in access to dental care). The Childsmile programme however is wider than a fluoride varnish programme and incorporates other elements, like toothbrushing in nurseries and schools. Through the Childsmile programme children are offered an examination, oral health advice and, where appropriate, fluoride varnish application in the dental clinic. Children between the age of 3 and 6 also receive twice yearly fluoride application in nurseries and schools as well as free supervised tooth brushing from the Childsmile team. Since the programme began, the number of children registered with an NHS dentist has increased from 55% to 84%, and the number of year 1 children who were free of tooth decay has risen from 56% to 72%.

A Cost-effectiveness simulation of children in Medicaid in Iowa was conducted in 2006. The analysis assessed Fluoride Varnish Application (FVA) by Physicians implemented in Well-child periodicity schedule (WCPS) with applications at 9, 18, 24 and 36 months compared to no FVA in the first 42 months of life (Quinonez 2006). In this study, the cost of Fluoride Varnish application was \$ 64.00. Restorative treatment cost was reduced by \$52 in the FVA group, but the overall cost in the FVA group was \$10.93 more expensive per child between the ages of 9 and 42 months. The incremental cost per cavity-free month was \$ 7.18 and the incremental cost per treatment averted was \$203.00. The authors concluded that fluoride varnish were an effective form of dental decay prevention, however it was not cost saving up to 48 months of age (Quinonez 2006).

A Cochrane review, conducted in May 2013, included the results of 22 trials and a total of 12,455 children (Marinho 2013). Bearing in mind quality concerns regarding the trial design of some of the included studies, the 13 trials that looked at children and adolescents with permanent dentition, showed a 43% reduction in DMFT in the fluoride varnish group. 10 studies assessing the impact on fluoride varnishes on incisor dentition showed a reduction in 37% in dmft scoring (Marinho 2013).

Another systematic review into the question whether the professional application of fluoride varnish decreases the incidence of dental caries in preschool children was conducted in 2010 (Carvalho 2010). The review included 8 studies, and many were considered to have weak methodology, with only one trial being double-blind and only one describing the randomisation and allocation concealment. Despite these limitations, the author's conclusion was that Fluoride varnish may be effective in preventing dental caries in pre-school children.

A further literature review was conducted assessing the impact of fluoride varnishes in permanent dentition of children aged 6 to 14 years only (Strohmenger 2001). This review included only 3 RCTs (and 463 children receiving treatment, and 461 control participants) meeting the inclusion criteria. The small number of included studies and issues relating to significant heterogeneity of the included studies limited the conclusion that were able to be drawn from this review, but the author's conclusion stated that "fluoride varnish was efficacious in caries prevention.

Additionally there is evidence from a retrospective cohort study from Sweden, including 27,943 young people (aged 12-15), that a school-based programme of fluoride varnish applications 18 months apart significantly reduced the incidence of caries in the intervention group (Bergstrom 2016). A study conducted in Sweden, estimated the annual cost of the programme at about 11 Euro per adolescent in a school-based programme aimed at 12-15 year olds, with 18 monthly

applications of fluoride varnish (Bergstroem 2016). In the study by Quinonez, the cost of Fluoride Varnish application was \$ 64.0 (Quinonez 2006). According to the WHO, the cost of fluoride varnish is \$1 -\$4 per application. However the cost of the programme will be higher than this, and will depend on the specific set up and local context.

The core element of Childsmile had an annual cost of £1.8 million (2009/10 values) and resulted in a reduction of decayed teeth by 47%. In the year 2008/9 around 12,000 fluoride varnish applications were performed as part of the Childsmiles programme (Turner 2009).

In Northumberland, based on 2014 population estimates, there are 34,635 children and young people aged 0-18 years. Implementing a programme of fluoride varnish in Northumberland could decrease the prevalence of dental decay, but the initial costs are likely to be high. And in view of the current financial situation, it needs to be considered, if this would provide the best value for money for Northumberland County Council.

Fluoridated toothpaste

Fluoridated toothpastes are another form of topical application of fluoride, and are the most widespread form of topical fluoride delivery (Marinho et al. 2003). Fluoride Toothpastes have the vast majority of the market in the UK.

The general reduction in levels of dental decay over the last 30 years has been attributed mainly to the introduction and widespread use of fluoridated toothpaste (Marinho et al. 2003). In 2003, a systematic review to assess the effectiveness of fluoride toothpastes in the prevention of dental caries in children was conducted by Marinho et al for the Cochrane oral health group, and published in the Cochrane database for systematic reviews (Marinho et al. 2003). The review found clear evidence of the caries-inhibiting effect of fluoride toothpaste by an average of 24% measured in decay, missing and filled tooth surfaces (D(M)FS), when brushing twice a day. The review found no significant difference in dental decay reduction through the use of fluoride toothpastes when taking into account background levels of fluoride (through for example water) (Marinho et al. 2003).

A concern that is raised in relation to Fluoride is the occurrence of enamel defects, dental fluorosis⁶⁵. Rates of dental fluorosis have been increasing; both among children living in areas with artificially fluoridated water supply, as well as those living in communities not receiving artificially fluoridated water. Therefore the use of fluoridated toothpastes by young children and during the time of tooth formation (up to 6 years of age), has been considered as an important factor for the development of these changes (Marinho et al. 2003).

Systemic fluoride

Fluoridation of milk

Milk fluoridation as an alternative to water fluoridation was first started in Switzerland about 50 years ago (Banoczy 2009). Since then programmes of milk fluoridation have been implemented in many countries around the world. Among these countries are Bulgaria, Thailand and Chile. A number

⁶⁵ Dental fluorosis: is a change in the appearance of the tooth's enamel which is caused by an exposure to too high levels of fluoride at the time of tooth development in children. Different levels can be distinguished, with the mildest forms presenting as barely noticeable white flecks, occasional white spots, frosty edges and fine, lacey chalk-like lines to more severe forms of larger white spots and rarely rough, pitted surfaces. (CDC 2015)

of studies in different countries, including Scotland, USA and the United Kingdom have tried to explore the benefit of such schemes. Milk, as a vehicle for fluoride is an obvious choice, when considering the benefit and important role that milk plays on childhood nutrition worldwide. Milk has also been suggested to have protective properties against dental caries (Banoczy 2009). Most studies showed reduced rates of dental decay. However, the fluoride needed to be ingested early enough to affect primary dentition, and also at the time of eruption of molar teeth, to effect permanent teeth.

The amount of fluoride added to the milk in each scheme will depend on local milk consumption and the availability of fluoride from other sources. A number of considerations need to be taken into account when assessing the feasibility of water fluoridation schemes. These relate to the milk distribution system, the intake of fluoride from other sources and the oral health of the population (Banoczy 2009). With the variation in water fluoridation across Northumberland, intake of fluoride will vary across the population, and this could be an issue, when planning a potential scheme of milk fluoridation, with children potentially living in an area of water fluoridation, and attending a school in an area without, or vice versa. Most schemes utilise schools as a way of distributing fluoridated milk to children (Baoczy 2009).

Milk fluoridation schemes have been successfully implemented in some communities and countries across the world, and mainly play a role in areas where water fluoridation is not possible or feasible. A main issue will be ensuring adequately fluoridated milk is distributed to children at the right times in their life, for it to have the main impact on primary, as well as permanent dentition (Bancozy 2009). This entails a risk of increasing health inequalities, with a potential of the scheme not reaching those most at risk.

Milk fluoridation schemes require the set up and monitoring of a milk distribution system, if this not already established. The initial investment can be substantial, and on-going management is required to address the logistics of running the scheme (like consent arrangements and distribution)

Northumberland currently does not have a scheme of milk fluoridation. However some areas of Northumberland receive fluoridated water supplies, leading to significant variations in exposure to background levels of fluoride within the population, which would pose a significant problem for the development of milk fluoridation. In this setting, the exploration of an extension of the water fluoridation arrangements leading to more equal background exposure to fluoride across the population would be the most appropriate method of increasing the access to systemic fluoride. Only if this is not feasible, should a milk fluoridation scheme be considered.

Community Water fluoridation

Water fluoridation is a population wide strategy of increasing access to fluoride for entire populations. The decay reducing effects of fluoride present in drinking water was first noted at the beginning of the 20th century. It was explored in different settings between 1901- 1944, before the introduction of the first schemes of artificial water fluoridation were commenced in 1945, in Grand Rapids, Michigan, USA (Mullen 2005). Initial studies, comparing the fluoridated areas with neighbouring non-fluoridated areas, found significant reductions in the dental decay rates of children, in the areas of water fluoridation (50% or more) (Mullen 2005).

Water fluoridation is an important public health intervention, proven to reduce inequalities, by improving the dental health of the entire population, while having the largest treatment effect in areas of deprivation; a monitoring report by PHE found an average of 15% reduction in dental decay of five year olds in fluoridated areas (11% for 12 year olds) compared to non-fluoridated areas, increasing to a 28% reduction in dental decay (21% for 12 year olds) when deprivation and ethnicity have been taken into account (PHE 2014 (b)).

A recent report, on oral health of children in Bedford, published by PHE in November 2015, shows the potential impact of discontinuing water fluoridation on children's teeth (PHE 2015(b)). The report highlights some of the difficulties in drawing clear conclusions from the data, but it suggests an increase in children with dental decay experience in 2015 compared to 2008, with a potential higher increase, in areas where water fluoridation had stopped, compared to those that had never received water fluoridation (PHE 2015(b)).

In 2015, a systematic review by Iheozor-Ejiofor et al. was conducted to assess the effectiveness of water fluoridation on dental caries prevention as well as on the development of dental fluorosis. The review found, that the majority of studies, meeting the reviewer's inclusion criteria, were conducted prior to 1980 resulting in a lack of evidence of the use of water fluoridation in the 21st century (Iheozor-Ejiofor 2015). The lack of more contemporary studies identified by the reviewers, is likely to be as a result of the specific inclusion criteria for the review which required included studies to relate to fluoridation schemes that had commenced not more than 3 years prior to the study. By definition, this excludes areas with longer established water fluoridation schemes to be included in the review. The majority of community water fluoridation schemes in the UK were implemented more than 40 years ago so could not have been included in this review. The review provides evidence of the effect of the introduction of water fluoridation schemes on the population's dental health. The review additionally set out strict criteria regarding the recording of dental decay in children, further limiting eligible publications for inclusion.

The review however, found a clear reduction of dental decay among children with a 35% reduction in dmft and 26% reduction in DMFT following the initiation of water fluoride (Iheozor-Ejiofor 2015). These findings are in keeping with the findings from a number of earlier systematic reviews⁶⁶, as well as findings from Public Health England's monitoring report from 2014 (PHE 2014 (b)).

The benefit of fluoride and also water fluoridation on children's teeth is evident, however Iheozor-Ejiofor et al. recommend, that when considering the implementation of water –fluoridation programmes in the current age, a number of population specific factor need to be considered. These include: the population's oral health behaviour (use of fluoride toothpaste), availability and uptake of other caries prevention strategies, their diet (especially in regards to sugar consumption) and use of tap water as well as population migration patterns (Iheozor-Ejiofor 2015).

The main focus of water fluoridation schemes is often on the dental health of children; however there is also evidence of water fluoridation on improving the oral health of adults. A systematic review by Griffin et al in 2007 showed a reduction of about one third (27%-35%) of tooth decay

⁶⁶ References for: University of York 2000, The US Community Preventive Services Task Force 2002 and 2013; Australian National Health and Medical Research Council in 2007

prevalence in 18- 65 year olds across 5 countries (US, UK, Canada, Australia and Sweden) from water fluoridation (Griffin et al. 2007).

Slade et al. showed that the length of exposure to either fluoridated or non- fluoridated water supplies increased the difference between the compared population in regards to dental decay prevalence, with those born before 1961 experiencing a 30% reduction in the prevalence of dental decay, and those born between 1960-1990 a reduction of 21% (Slade et al 2013). This provides evidence of the fact that water fluoridation provides continuing benefit on the oral health of individuals.

Water fluoridation might also have an impact on adults retaining their teeth, with a study conducted by O'Mullane and Whelton in Ireland showing a higher prevalence of people retaining their natural teeth in fluoridated areas (O'Mullane and Whelton, 1992; Mahoney et al, 2008). Around one in three of 45 to 54 year olds who had always lived in non-fluoridated areas had no natural teeth, compared with only around one in ten of those who had lived at least 25 years in fluoridated areas. Those aged 65 and over who had always lived in non-fluoridated areas had 62% more root caries than those who had lived at least 25 years in fluoridated areas.

Community Water fluoridation is endorsed by the World Health Assembly as a global strategy in preventing oral disease and is internationally recognized for the benefits on oral health in adults and children: "Community water fluoridation is effective in preventing dental caries in both children and adults. Water fluoridation benefits all residents served by community water supplies regardless of their social or economic status." (53rd World Health Assembly 2000)

The US Centre for Disease Control and Prevention stated in 1999: "*Water fluoridation remains the most equitable and cost-effective method of delivering fluoride to all members of most communities, regardless of age, educational attainment or income level.*" (CDC 1999)

Concerns over the safety of water fluoridation schemes have been raised and reviewed on numerous occasions, since the introduction of water fluoridation schemes. Both, the 2000 NHS Centre for Reviews and Dissemination (York Review) review, as well as the Medical Research Council (MRC) review in 2004 have concluded that water fluoridation is safe (Mullen 2005⁶⁷). Dental fluorosis can be caused by water fluoridation, and higher levels of dental fluorosis have been found in areas, with fluoridated water supplies. However the severity of dental fluorosis varies, with the majority of effected individuals having levels of dental fluorosis that does not cause any cosmetic concerns. Only a very small percentage of individuals have levels of dental fluorosis that causes cosmetic concerns, and treatment options are available for those effected (Mullen 2005).

Peterson et al, in their 2004 report for the WHO, concluded, summarizing the evidence, that water fluoridation reduces the prevalence of dental caries by 15% and by 2.2 dmft/DMFT⁶⁸, and that fluoride toothpastes and mouth rinses reduces the DMFT 3 year increment by 24-26% (Peterson 2004). A majority of water fluoridation schemes were introduced in the late 60s and early 70s, before the widespread availability and use of fluoride containing toothpastes. Thus it is difficult to predict

⁶⁷ referring to York review and MRC review

⁶⁸ dmft/DMFT: number of teeth decayed, missing or filled in primary dentition (dmft) or permanent dentition (DMFT)

the impact on reduction of dental decay in areas in the UK if new fluoridation schemes were to be introduced or extended. However, water fluoridation has advantages for oral health, beyond those derived from the use of fluoride containing toothpaste (Jones 2005). A reduction of dental decay and an improvement of oral health as a result of the introduction of water fluoridation are likeliest to be seen in those at highest risk of dental disease, and those living in socio-economic deprivation. Thus introduction of water fluoridation has a potential of decreasing health inequalities, and reaching those, most at need.

PHE has the responsibility of monitoring water fluoridation schemes on behalf of the Secretary of State for health. As part of this role, PHE regularly collect information on dental outcome measures, as well as a number of potential side-effects on different organs of the body. In a recently published monitoring report, PHE concluded water fluoridation to be safe and effective (PHE 2014 (b)).

Globally there are now 25 countries with community water fluoridation schemes (these include the USA, Canada, Ireland, Spain, Australia, New Zealand, Hong Kong (China), Brazil and others), and a further 28 countries with naturally occurring levels of fluoride of or in excess of the level at the target level of fluoridation schemes (these include Austria, Denmark, Sweden, France, Finland, China, India, Tanzania and others)(Iheozor-Ejiofor et al. 2015). Some countries, that do not operate fluoridated water schemes, nor have high levels of fluoride naturally occurring in their population use other forms of fluoride exposure their population (like salt fluoridation in Germany (Schulte 2005; Marthaler 2005), Switzerland, France, Costa Rica, Columbia and Jamaica (Marthaler 2005)).

About 74 % of US population receiving their water supply from public water providers receive fluoridated water (BfsWEB), and 44% of the total population of Canada are receiving fluoridated water (BfsWEB). In the UK around 6 million people receive fluoridated water, and 330, 00 naturally fluoridated water (BfsWEB/ PHE 2014 (b)). Most fluoridation schemes in the UK were implemented in the late 60s. Among these is the scheme of water fluoridation in Northumbrian's neighbour, Newcastle upon Tyne, and in some areas in Northumberland.

Appendix10

Community engagement through Health-watch

To ensure that the communities' voice is captured, as part of this oral health needs assessment, Health watch was involved, to help capture the views of representatives of different communities. . A questionnaire was developed, and trailed by the Public Health team, as well as the ADAPT staff. Suggested changes were made to the questionnaire following this initial trial. After this, Health Watch and the local council circulated the questionnaire. The questionnaire was promoted on different occasions to try to increase the reach. The questionnaire consisted of 40 questions relating to different aspects of oral health, with a combination of multiple choice questions and free –text options. The themes that the questionnaire explored could be grouped into 5 topic areas:

Good oral health related perceptions

Access to dental services

Dental hygiene practices

Access to fluoride

Consumption of sugar containing foods and drinks

The full list of survey questions can be found in the Appendix of this document.

Results of the survey

A total of 170 responses were collected by the online survey. The results were analysed by reviewing the counts of answers to the questions, and grouping the themes from free text answers.

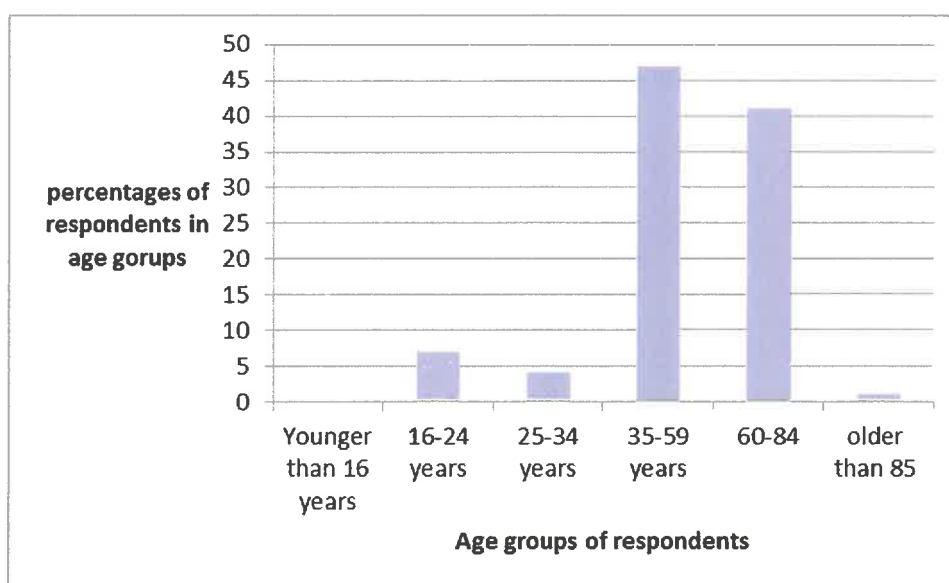


Figure 44: age distribution of questionnaire respondents

Demographics of respondents

The majority of respondents were either in full time employment (43%) or retired (34%). An additional 14% of respondents were employed part time, 5% were self-employed and 2% were in full time education. Only 4% of respondents described themselves as unemployed. This is not too different to the rate of unemployment in the country overall (6.1% according to labour market North East 2014-2015).⁶⁹ However it is a higher representation of retired individuals (county estimate 24.6% for Northumberland according to labour market North East 2014-2015).

Respondents were asked to give their postcode. 4 respondents did not provide their postcodes. The other 166 respondents came from different areas across Northumberland. Residents came from all for CCG locality areas of Northumberland: Blyth Valley, Central, North and West.

CCG locality	Number of respondents
Blyth Valley	31
Central	57
North	42
West	36
N/A	4

Table 22: Number of respondents per CCG locality in Northumberland

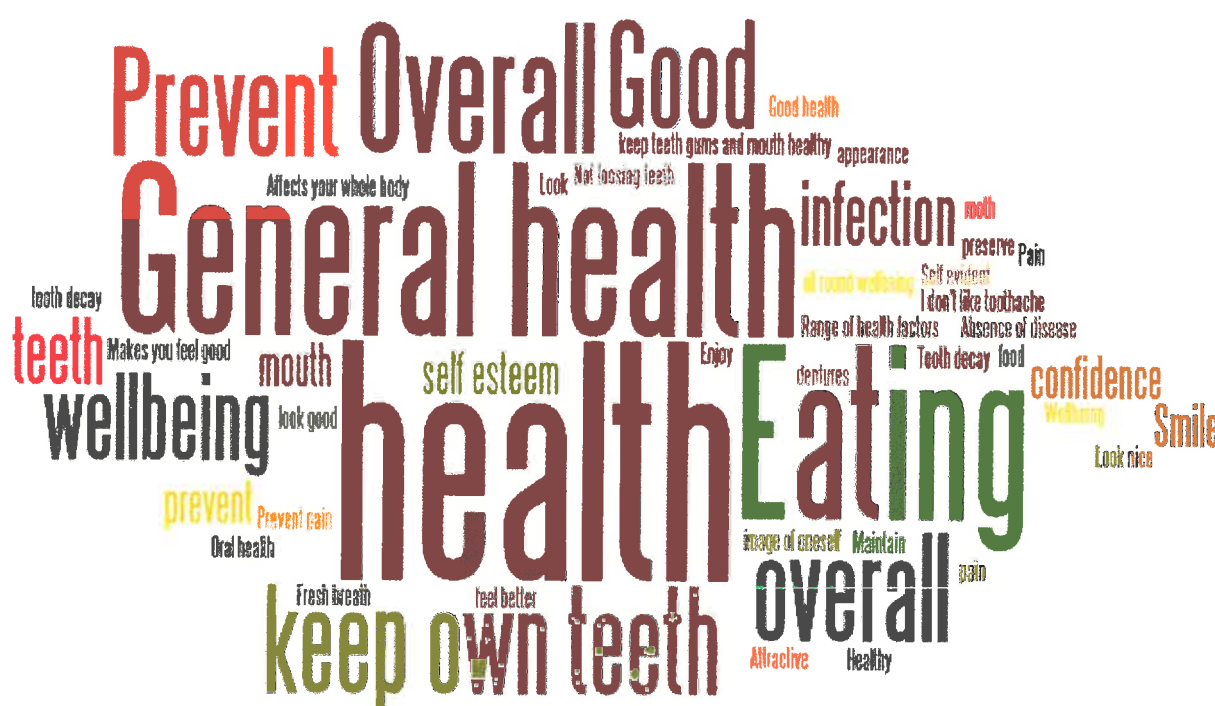


Figure 45: Word Cloud from comments to the question: "What does having healthy teeth and mouth mean to you?" in the questionnaire circulated by Health watch (wordle)

⁶⁹ http://www.labourmarketnortheast.co.uk/app/assets/files/areaprofiles/northumberland_profile.pdf

Responses from OHNA patient engagement survey

The time taken to complete the questionnaire ranged from 3.1 minutes to 75.4 minutes, with the average time taken by respondents being 10 minutes.

Good oral health

For most of the participating individuals it was important to have healthy teeth and mouth (96%). Respondents were given the opportunity to respond with free text to explain why it was important to them. The themes of responses to this question has been visualised in the word cloud above (Figure 42). The responses showed that the respondents did feel their oral health to play an important element in their enjoyment of their daily lives and their overall health and wellbeing. A common theme was also the importance of looking after teeth and gums in order to ensure respondents were able to maintain their own teeth as long as possible.

Interestingly, only just over a quarter of respondents (28%) indicated that having white teeth was a sign of healthy teeth and mouth to them. Responding "other" as their answer had the opportunity to provide further information of what this was. The answers to this were in keeping with the responses as to why oral health was important to respondents.

Free text answer of "other" meaning of healthy teeth and mouth	Number of statement
Confidence to smile	2
Keeping my teeth if at all possible	1
Disease Free mouth, no caries	1
Poor oral hygiene can lead to other medical issues in other parts of the body	1
Maintaining oral health	1

Table 23: Free text answers of "other" in response to question: "What does having healthy teeth and mouth mean to you?"

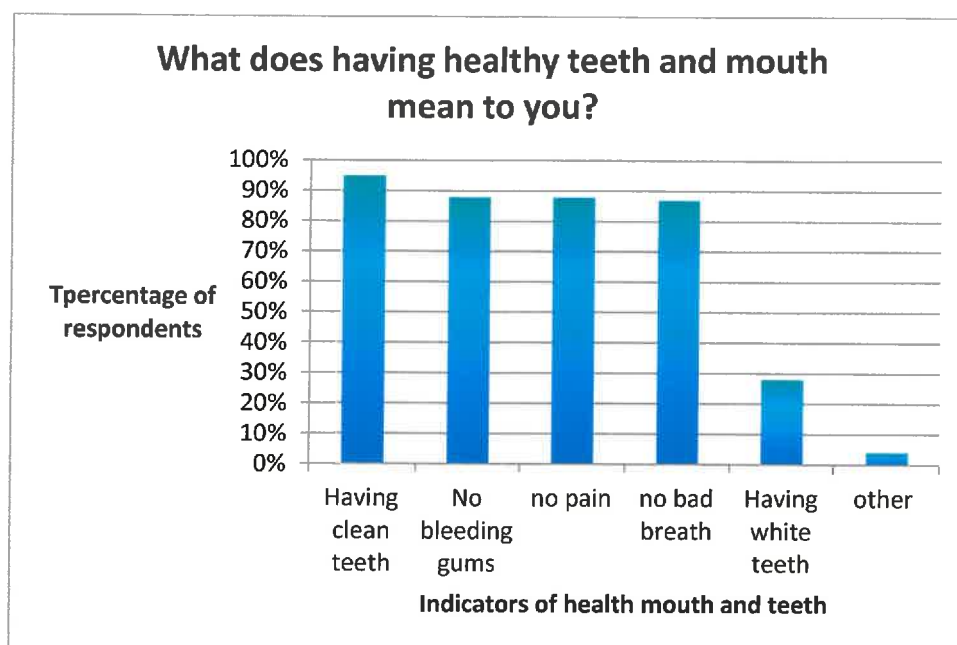


Figure 46: Responses to the question: “What does having healthy teeth and mouth mean to you?” given as percentages of respondents indicating the different categories as important

Just under a quarter (24%) of all respondents rated the health of their teeth and mouth as very good, with just under half (46%) rating it as good. Only 6% of respondents rated the health of their teeth and mouth as poor and 3% as very poor.

Keeping teeth healthy

When asked, what respondents did to keep their teeth healthy, nearly all (99%) stated brushing their teeth, with 79% stating that they would go to their dentist regularly. Just over half of respondents stated that flossing and 38% seeing the dental hygienist was part of keeping their teeth healthy. Over a third (37%) of respondents answered they would go to see their dentist when they had pain or problems. 8% (13 respondents) mentioned other things they would do to keep their teeth healthy. This included electric air floss and mouthwash, healthy eating, chewing sugar free gum after every meal as well as waiting for 30 minutes after food before brushing

Tooth-brushing behaviour

The vast majority of participants of the survey brushed their teeth at least twice a day (72%) and just over a quarter brushed their teeth once a day. Only 2% of survey participants brushed their teeth never or less than once a day. Just under three quarter of the participants (71%) stated that they would always use fluoride containing toothpaste, with 11% saying they would, if it was available, and a further 15% weren't sure whether their toothpaste contained fluoride. Only five respondents (3%) responded that they would never use fluoride containing toothpaste.

Most participants said they would replace their toothbrush at least every 3 months (44%) and 8% would replace their toothbrushes when the bristles are frayed. About a third of participants (37%)

would replace their toothbrush between 3-6 months. 11% of respondents changed their toothbrushes less frequently than every 6 months.

Use of dental hygiene products

Respondents were asked what (if any) other dental hygiene products they used. The responses can be found in figure 44. The 11 respondents (7%) that stated they used other dental hygiene products were given the opportunity to respond in free text. The 10 responses that gave free text options to mentioned toothbrush (x5), sonic air flosser (x3) and water flosser (x2) as additional dental hygiene products used by respondents.

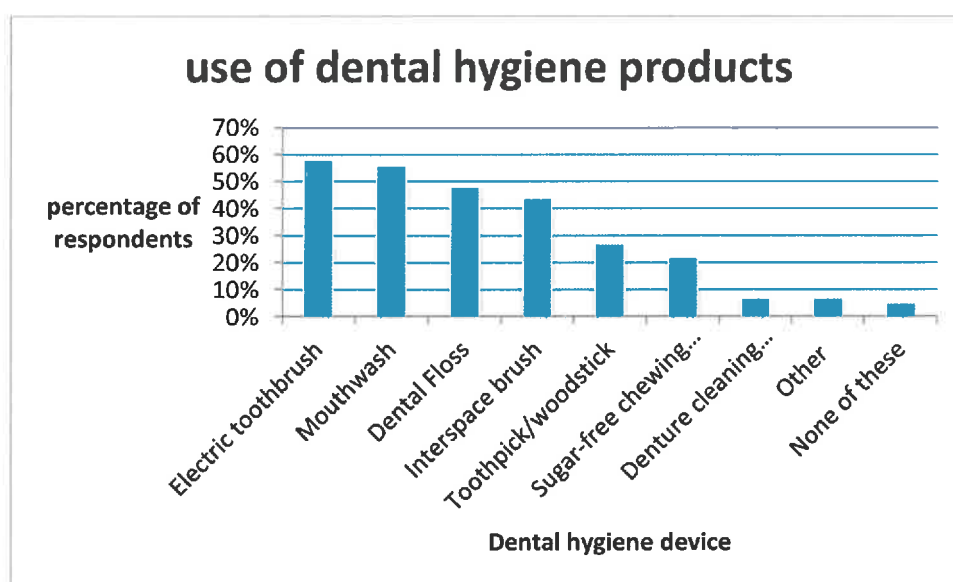


Figure 47: responses as percentage of respondents stating using the different dental hygiene products in the population survey.

Awareness of behaviours with potential negative impact on dental health

In general, the awareness of what kind of behaviours might impact dental health negatively was fairly high, among respondents. 71% of respondents recognised that drinking fruit juice can harm teeth, and over three quarters of respondents (76%) recognized that eating food containing sugar had a negative impact on dental health. The three behaviours that were considered bad for teeth by most respondents were not seeing a dentist regularly (89%), drinking sugar-sweetened drinks (91%), and not brushing (96%).

Other oral health related behaviours

Access to dental care

The majority of respondents stated that they attended dental appointments at the frequency suggested to them by the dentist (138 out of 170 responses (81.2%)).

Respondents indicating that they were not attending their dentist regularly (or as frequently as advised by the dentist) were asked to choose a reason stopping them from a list of options. The reason given as the main deterring factor was respondents being afraid of going to the dentist, with

nearly a third (30%) choosing this option. The next most frequent option chosen were not being able to afford NHS charges (27%), Having had a bad experience with a dentist in the past (27%) and there not being anything wrong with the respondents teeth or there not being a need to go to the dentist (27%) (Figure 45).

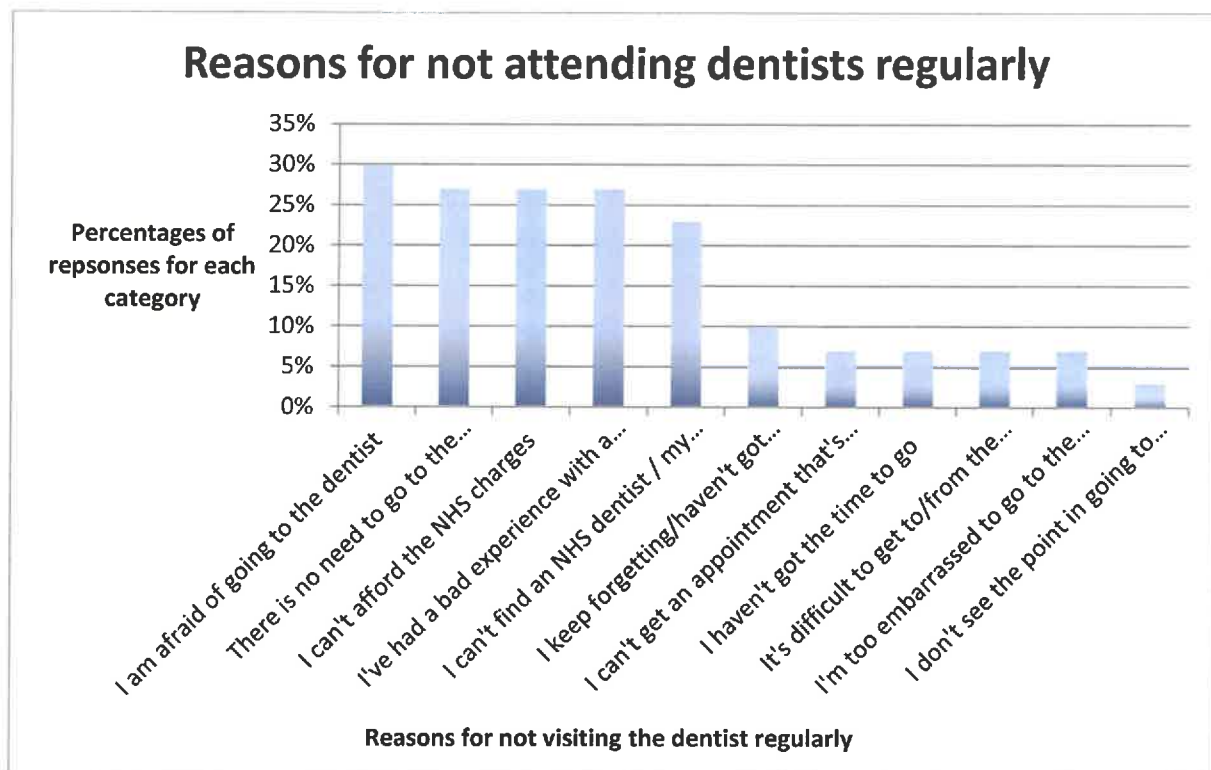


Figure 48: Responses to the question why respondents were not visiting their dentist regularly. Respondents were able to choose category from a menu of responses.

Over half of respondents, stating that they were afraid of going to the dentist also stated that they had had a bad experience with a dentist in the past (5 out of 9).

Respondents were also given the option to enter a free text answer of what would encourage them to attend the dentist more regularly. For this, 26 responses were given. Three respondents (11.54%) stated that there would be nothing that would encourage you to see the dentist more regularly. The other responses were broken down into themes. Nine respondent stated cost as the main factor, 5 respondents stated a better experience with their dentists as a reason 3 individuals were deterred because of their anxiety, availability of NHS dentists was mentioned by 3 respondents.

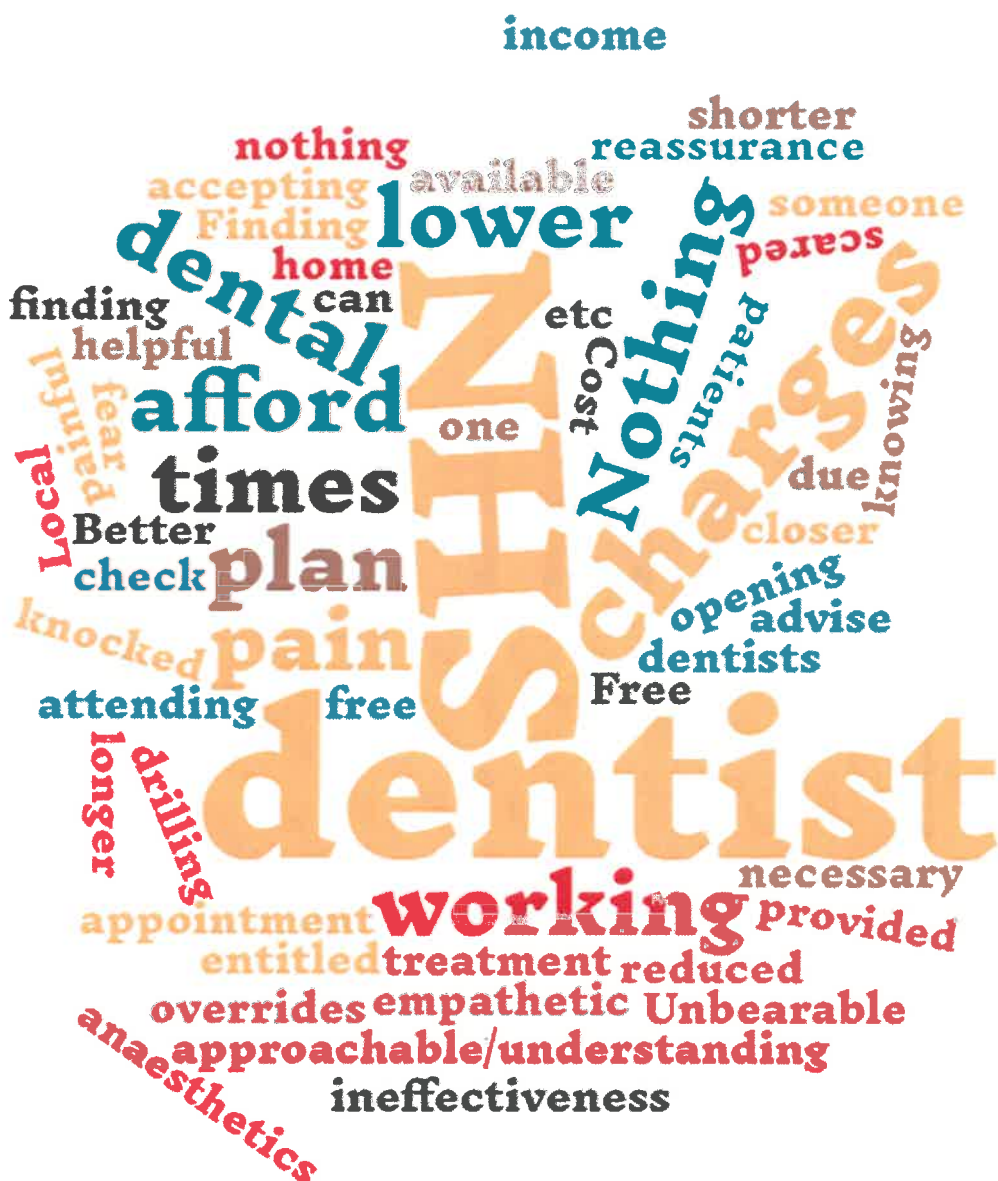


Figure 49: free text responses to the question: "What would encourage you to see a dentist more regularly?"

The reasons that respondents mentioned that would encourage them to attend their dentists more regularly were also grouped into different themes. The prevailing reason was related to the cost, with a third of responses being related to cost (with 10 out of 31 responses). The next highest reason for encouraging regular attendance with a dentist were given as "a better experience" (5 out of 31 responses). Three respondents stated that their anxiety was the main reason for not attending their dentist regularly, and this is potentially linked to their experience of dental care. Three responses were in relation to availability of NHS dentists, with an additional 3 responses stating that lack of convenience around attending dentist was deterring them from attending their dentist.

reason that would encourage regular attendance	number of responses under this theme
cost	10
better experience	5
availability of NHS dentist	3
less anxiety	3
need	3
convenience	3
better appointments	1
nothing	3

Alcohol, smoking and Diet

The questionnaire asked some questions in relation to alcohol and sugar consumption, as well as smoking of participants of the survey.

Alcohol

Respondents were asked about their alcohol consumption. The responses to the question “How often do you have a drink containing alcohol?” are displayed in Figure below.

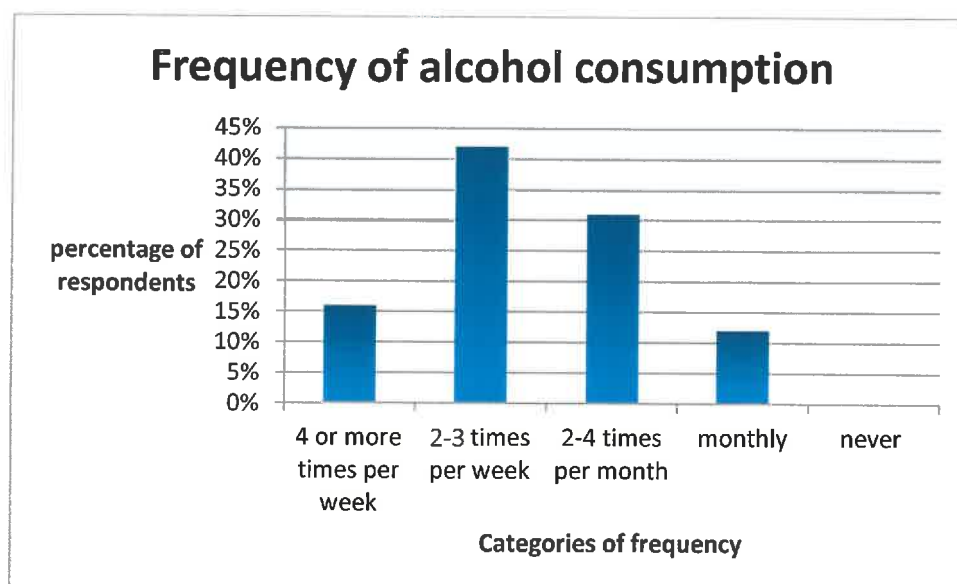


Figure 50: Respondents to the question: “How often do you have a drink containing alcohol?”

To further quantify the amount of alcohol consumed, the respondents were asked how many units of alcohol they would drink on a typical day when they were drinking. The majority of respondents had a reasonable alcohol consumption, with 45% (n=54) stating drinking 1-2 units, and a further 23% (n=27) drinking 3-4 units. However, there was a significant number of respondents stating drinking significant larger amounts, with more than one in ten (12%/n=14), stating they would drink 10 units or more on a typical day when they drink, and a similar amount (11% /n=13) stating drinking 7-9

units and 5-6 units (10%/ n=12) leading to a third of respondents drinking more than 5 units of alcohol on days that they drink.

As people can have varying patterns of alcohol consumption, thus making it more difficult to ascertain the risk from alcohol on medical conditions like oral cancer, respondents were asked how frequently they would exceed the recommended amounts (6 or more units for women, and 8 units in men). Over a quarter (28%/ n=33) of respondents never exceeded recommended levels, with 45% (n=54) stating they exceeded the recommended levels less than monthly, and a further 14% (n=17) stating exceeding the level monthly. This leaves 14 % exceeding the levels more frequently, with 11% (n=13) exceeding the recommended levels weekly, and 35 (n=3) exceeding the level daily or almost daily.

Interestingly, all respondents stating exceeding the recommended levels on a daily or near daily basis stated having visited their dentist in the preceding 6 months. Half of respondents (5 out of 10) stating exceeding recommended levels of alcohol consumption on a weekly basis stated having seen a dentist less than 6 months prior to the survey, with 3 respondents having seen a dentist between 1-2 years, and 1 respondent each stating having seen their dentist more than 2 years ago, but less than 5 years ago, and more than 5 years ago. The survey did not allow any conclusion to be drawn, as to whether dentist addressed issues in relation to alcohol consumption with their patients in general or those with higher risk level alcohol consumption in specific. However it does suggest that many patients with higher level alcohol consumption do make contact with dental professionals. Those not attending their dentist on a regular basis with higher alcohol consumption stated the reason as being that there was no need to see their dentist as there was nothing wrong with their teeth, and that NHS charges were a deterring factor. Anxiety and embarrassment in relation to seeing a dentist were also mentioned by respondents. All of the respondents mentioning exceeding the recommended levels on a weekly or more frequent basis all were in full time employment.

Diet

Participants Of the questionnaire were asked about their diet and the amount and number of a number of specific foodstuffs and drinks they consume on an average week.

Over half of respondents stated eating fresh fruits on more than 5 days per week. However, consumption of confectionaries was still fairly high, with only 27% of respondents stating they “rarely or never” consumed sweets or chocolates, and 40% saying they ate these products 2-4 times a week.

The majority of respondents (60%, n=102) stated eating fresh fruits 5 or more days a week, with an additional quarter of respondents (25%, n= 43) stating they consumed fresh fruits on 2-4 days of the week. Only a small proportion of respondents 9%, n=16) only consumed fresh fruits “once a week or less”, or “rarely or never” (5%, n=9).

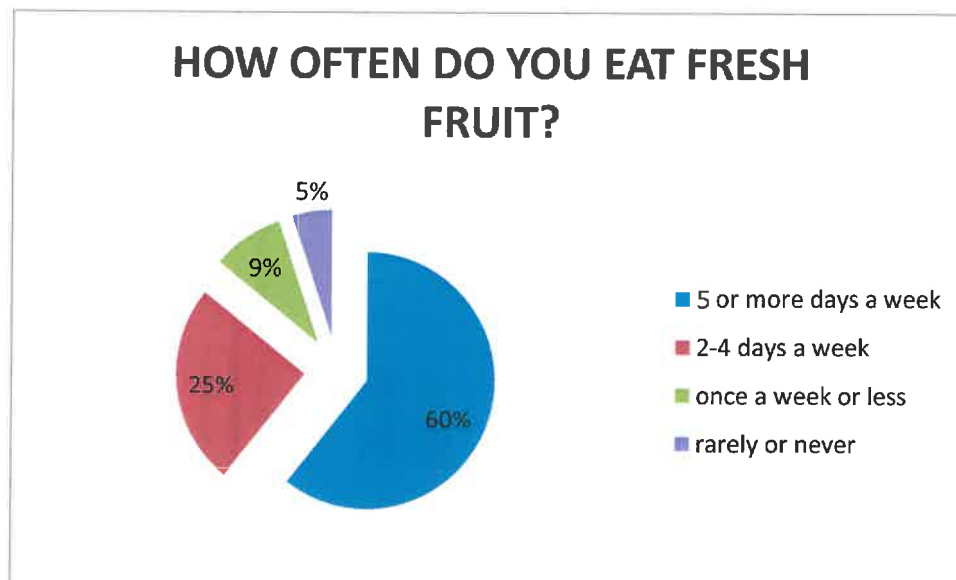


Figure 51: Responses to the question: " how often do you eat fresh fruit?" from the engagement questionnaire.

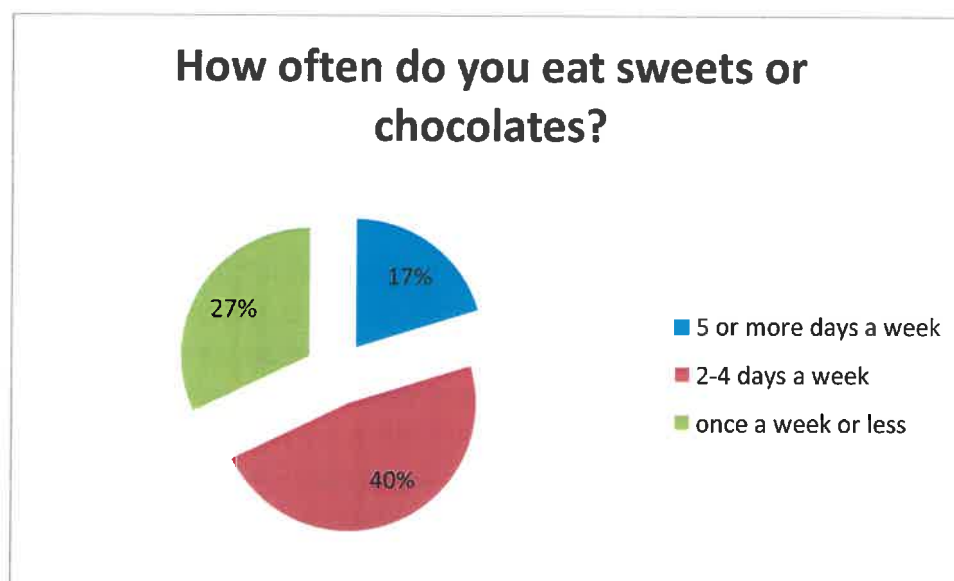


Figure 52: Responses to the question " How often do you eat sweets or chocolates? " from the engagement questionnaire.

Just under one in five respondents (17%, n=29) consumed sweets or chocolates on 5 or more days of the week. 4 out of 10 respondents (40%, n= 67) stated they ate sweets or chocolate on 2-4 days a week, and just under a third of respondents (27%, n=45) only consumed confectionaries once a week or less. Encouragingly, just under one in five respondents (17%, n=28) consumed sweets or chocolate "rarely or never".

The majority of respondents (84%, n=140) drank water on 5 or more days of the week, with only a small proportion of respondents saying they drank water "once a week or less" (4%, n=7) or "rarely or never" (4%, n=7).

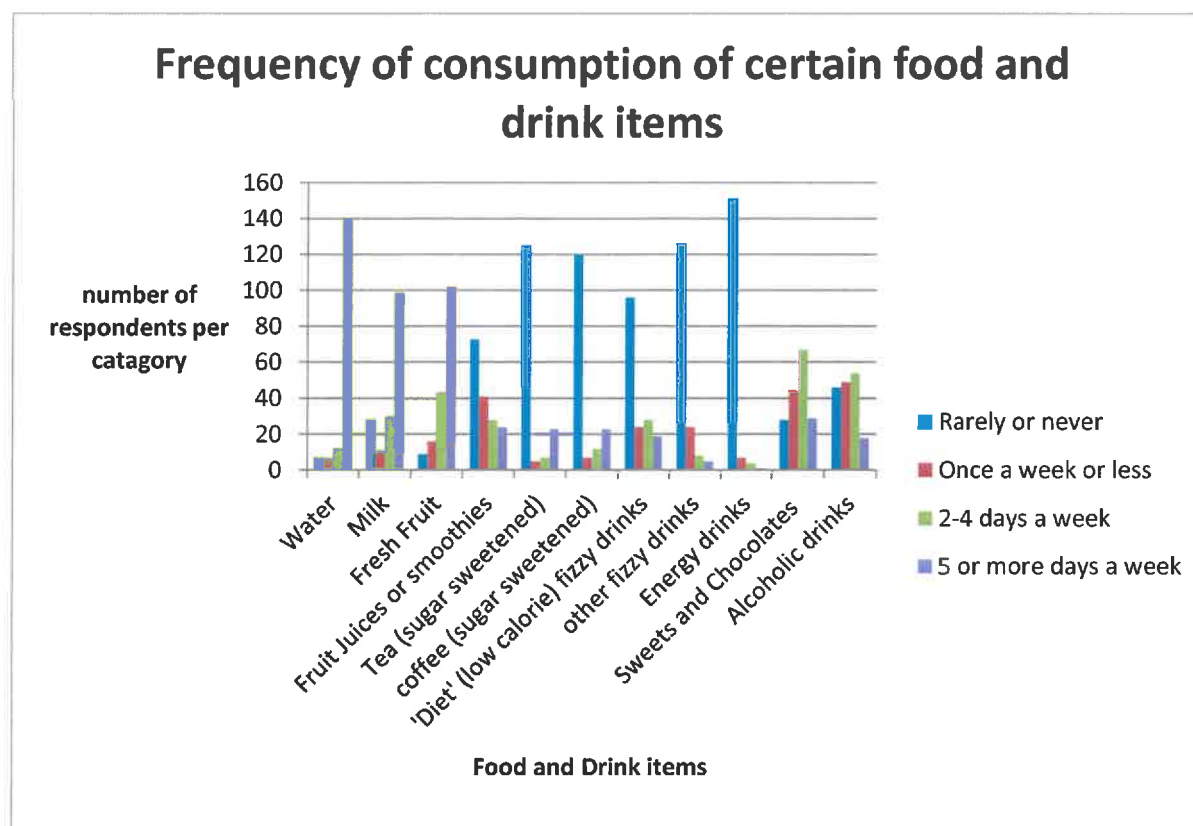


Figure 53: Responses to the question “How often do you eat or drink the following.” by the different items given

90% of respondents stated drinking tap water, with only 16 respondents (10%) not drinking tap water. When asked, what would encourage the respondents to drink tap water, the most common response was in relation to the taste of the tap water (two respondents stated the water tasted or smelled of chemicals, with one respondent stating that they didn't like the taste here, but would drink tap water in other areas. Two further respondents referred to taste as a factor, making it 5 respondents relating to this, with one additional response suggesting flavouring, as they did not like the taste of plain water). 4 respondents stated that nothing would encourage them to drink water, and one person was not sure, what would encourage them to drink more tap water. One response was in relating to contamination of water (mentioning *Campylobacter*).

Dental care

Impact of oral health

Half of all respondents stated that their teeth had never caused them any difficulties to any of the 9 potential health impacts that were listed in the survey (eating, smiling, laughing and showing teeth, relaxing, including sleeping, cleaning teeth or denture, enjoying contact to others, speaking, work, emotional instability, going out . or see survey in appendix). Of the respondents that described having experienced an impact on any of these areas of live, the majority of respondents stated issues with “eating” as the most common problem (74%; or 37% of all respondents), and “smiling or laughing and showing teeth without embarrassment” (44%, 22% of overall respondents) followed by difficulties with “relaxing, including sleeping” described by 32% (16% of all respondents).

Over half of all respondents (54%) reported having experienced bleeding gums in the preceding year.

One in ten respondents in the survey had no fillings (n=18 /11%) Of these 3 respondents indicated having dentures and two having had teeth extracted, but it was not known if this was due to dental decay or another cause. A third of participants had between 6-10 fillings (30%); and between 3-5 fillings (32%). About 1 in 7 respondents (14%) had more than 10 fillings, and the remaining 13% of participants had 1-2 fillings.

16% of respondents had dental implants that were due to dental decay.

Of the 18 respondents that stated not having dental fillings, the majority had never smoked (n= 13/72%), with only 2 respondents being current smokers. The type of dental care accessed by these respondents varied from private care (n=3) to combination of NHS dental care and private (n=4) or pure NHS dental care (paid for n=6/ Free NHS care: n= 2) (2 respondents were not sure or left this field blank).

Limitations:

Sadly the sample size was small, with a total of only 170 responses. The response rate to the survey is also unknown, as the survey went out through different platforms, including an online sent out through Northumberland County Council Communications team. There is a potential risk of responders' bias that those with good oral health and good oral health practices might be more likely to participate in the survey. It was also not possible to identify, if respondents filled the survey in more than once, even though hopefully the number of individuals filling the questionnaire more than once on their own behalf would be expected to be quite small. As a result of these limitations, the findings from this survey cannot be seen as representative for the overall population.

Summary from engagement questionnaire:

The response to the questionnaire showed that oral health was important to the respondents. Most respondents rated their oral health as at least good, and the knowledge of good dental hygiene practice was encouraging.

Prior experience of dental appointments and anxiety of attending a dentist seem to be interlinked in the eyes of patients, and are key factors deterring some respondents from regular dental attendance. Anxiety has been identified nationally factor influencing patients attendance of dental appointments, and that this is also affecting residents dental health care behaviour locally is not surprising. As the survey results are not representative of the residents of Northumberland as a whole it is difficult to estimate, what proportion of dental none-attenders are as a result of anxiety. It is possible, that respondents to this survey might be biased to those attending dentist regularly, and that some residents who feel anxious about attending a dentist, might choose not to participate in this survey. Thus anxiety as a deterring factor might be higher than this survey suggests. However, as this is the only information on a local level to date, it will be useful to share this with the dental professional network, to help inform their working in relation to quality improvement of their services.

Another key factor for respondents was the cost and convenience/availability of NHS dental appointments in deterring respondents from accessing NHS dental care. This finding is not unexpected, especially in view of Northumberland's geography, but it will be useful to feed this back to NHS England, as the commissioners of dental services especially in view of the reform of the dental contract.

Appendix 11

Engagement questionnaire

Oral health questionnaire

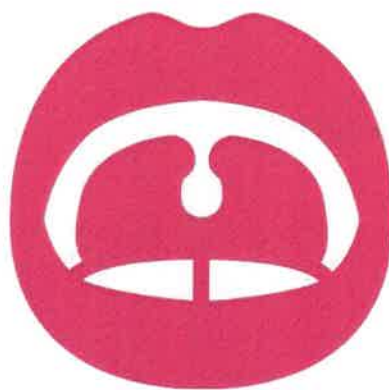
The Public Health department at Northumberland County Council (NCC) is seeking the views of residents on issues relating to oral health (the health of your teeth and mouth).

Oral health is important and is influenced by a number of things. The information you provide will be used to inform decision making by NCC and make it easier for all Northumberland residents to have good oral health.

If you live or work in Northumberland and would like to have your say, then please take part in this anonymous online survey. It should not take more than 10 minutes to complete.

The closing date for completing this survey has been extended to Sunday 26th June 2016.

About your teeth and mouth



Is it important to you to have healthy teeth and mouth?

Click one of the icons



If yes, why is it important?

What does having healthy teeth and mouth mean to you?

Select as many as are relevant

- ☐ Having clean teeth
- ☐ No bleeding gums
- ☐ No bad breath
- ☐ No pain
- ☐ Having white teeth
- ☐ Other

If other, please specify

How would you rate the health of your teeth and mouth?

Click one of the icons



What do you do to keep your teeth healthy?

Select as many as are relevant

- ☐ Brush them
- ☐ Floss
- ☐ Go to the dentist regularly
- ☐ Go to the dentist when I have pain or problems
- ☐ Go to see a dental hygienist
- ☐ Nothing
- ☐ Other

If other, please specify

How often do you brush your teeth?

Select one

- ☐ At least twice a day
- ☐ Once a day
- ☐ Never or less than once a day

Do you use toothpaste that contains fluoride?

Select as many as are relevant

- ☐ Yes, always
- ☐ Yes, if it's available
- ☐ No, never
- ☐ Not sure

Which of these dental hygiene products do you use?

Select as many as are relevant

- ☐ Electric toothbrush
- ☐ Mouthwash
- ☐ Dental floss
- ☐ Toothpick/woodstick
- ☐ Interspace brush
- ☐ Sugar-free chewing gum
- ☐ Denture cleaning product
- ☐ None of these
- ☐ Other

If other, please specify

How often do you replace your toothbrush?

Select one

- ☐ About every 3 months or less
- ☐ Between every 3 - 6 months
- ☐ Less frequently than every 6 months
- ☐ When the bristles are frayed
- ☐ Never

Have your teeth ever caused you difficulty with:

Select as many as are relevant

- ☐ eating?
- ☐ speaking?
- ☐ cleaning teeth or dentures?
- ☐ going out, for example to the shops or visiting someone?
- ☐ relaxing, including sleeping?
- ☐ smiling, laughing and showing teeth without embarrassment?
- ☐ carrying out major role or work?
- ☐ emotional instability, for example becoming more easily upset than usual?
- ☐ enjoying contact with other people, such as relatives, friends or neighbours?
- ☐ none of the above?

What would you say is bad for your teeth?

Select as many as are relevant

- ☐ Not brushing
- ☐ Not seeing a dentist regularly
- ☐ Drinking sugar-sweetened drinks
- ☐ Drinking fruit juices
- ☐ Eating food that contains sugar

Have your gums bled when brushing or flossing in the last year?

Click one of the icons



How many fillings do you have?

Select one

☐ None

☐ 1 - 2

☐ 3 - 5

☐ 6 - 10

☐ More than 10

How many dental implants do you have which are due to dental decay?

Select one

☐ None

☐ 1 - 2

☐ 3 - 5

☐ 6 - 10

☐ More than 10

Do you have dentures?

Click one of the icons



About your lifestyle



How often do you eat or drink the following?

Select one for each

	Rarely or never	Once a week or less	2-4 days a week	5 or more days a week
Fresh fruit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sweets or chocolate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Milk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Water	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
'Diet' (low calorie) fizzy drinks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other fizzy drinks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Energy drinks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fruit juices or smoothies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tea (sugar sweetened)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Coffee (sugar sweetened)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Alcoholic drinks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Do you drink tap water?

Select one



What would encourage you to drink tap water?

How often do you have a drink containing alcohol?

Select one

- ☐ Never
- ☐ Monthly
- ☐ 2 - 4 times per month
- ☐ 2 - 3 times per week
- ☐ 4 or more times per week

How many units of alcohol do you drink on a typical day when you are drinking?

Select one

This is one unit of alcohol...



...and each of these is more than one unit



- ☐ 1 - 2
- ☐ 3 - 4
- ☐ 5 - 6
- ☐ 7 - 9
- ☐ 10 or more

How often have you had **6 or more units if female**, or **8 or more units if male**, on a single occasion in the last year?

Select one

- ☐ Never
- ☐ Less than monthly
- ☐ Monthly
- ☐ Weekly
- ☐ Daily or almost daily

Do you currently or have you ever smoked?

Select one

- ☐ Currently smoke
- ☐ Used to smoke
- ☐ Have never smoked

How many cigarettes do you smoke a day?

Select one

- ☐ 1-9 a day
- ☐ 10-19 a day
- ☐ 20 or more a day

About your oral health care



How often do you visit a dentist?

Select one

- ☐ As often as my dentist advises me to
- ☐ Occassionally (less often than advised by my dentist)
- ☐ Only when I have trouble with my teeth
- ☐ I do not have a dentist

Which of the following treatments have you received in the last 5 years?

Select as many as are relevant

- ☐ Teeth scaled & polished
- ☐ Teeth filled
- ☐ Teeth extracted
- ☐ Crown fitted
- ☐ Abscess / infection treated
- ☐ Denture fitted
- ☐ Denture repaired
- ☐ I have not received any treatment

When was the last time you saw a dentist?

Select one

- ☐ 6 months ago or less
- ☐ More than 6 months, up to 1 year ago
- ☐ More than 1 year, up to 2 years ago
- ☐ More than 2 years, up to 5 years ago
- ☐ More than 5 years ago

If you are not attending a dentist regularly, what is stopping you from doing so?

Select as many as are relevant

- ☐ There is no need to go to the dentist / nothing wrong with my teeth
- ☐ I can't find an NHS dentist / my dentist changed to private
- ☐ I can't get an appointment that's convenient for me
- ☐ I am afraid of going to the dentist
- ☐ I can't afford the NHS charges
- ☐ I keep forgetting / haven't got round to it
- ☐ I've had a bad experience with a dentist
- ☐ I don't see the point in going to the dentist
- ☐ I haven't got the time to go
- ☐ It's difficult to get to/from the dentist
- ☐ I'm too embarrassed to go to the dentist

What would encourage you to attend the dentist more regularly?

What kind of dental care do you use?

Select one

- ☐ Free NHS dental care
- ☐ Paid for NHS dental care
- ☐ Private dental care
- ☐ A combination of NHS and private dental care
- ☐ Not sure

Why do you use NHS dental care?

Select as many as are relevant

- ☐ Affordability
- ☐ Location
- ☐ Reputation/recommendation
- ☐ Dentist only sees NHS patients
- ☐ Better quality of care
- ☐ Lack of availability of private dentists
- ☐ Shorter waiting times
- ☐ Easier to get a convenient appointment
- ☐ More types of treatment available
- ☐ My parent/guardian registered me
- ☐ No particular reason

Have you successfully made an NHS dental appointment in the last 3 years?

Select one

- ☐ Yes, and went to appointment
- ☐ Yes, but didn't go to appointment
- ☐ No, was unable to make an appointment
- ☐ Have not tried to make an appointment

How easy was it to make an NHS dental appointment?

Select one

- ☐ The appointment was booked during my last appointment
- ☐ I got an appointment straight away
- ☐ I made multiple visits/phone calls to make an appointment

If it was an emergency NHS dental appointment, were you seen as soon as you would have liked?

Click one of the icons



Why do you use private dental care?

Select as many as are relevant

- ☐ NHS dentist has gone private
- ☐ Unable to find an NHS dentist
- ☐ Better quality of care
- ☐ Better reputation
- ☐ Better location
- ☐ Shorter waiting times
- ☐ Easier to get a convenient appointment
- ☐ More treatments available
- ☐ Affordability
- ☐ Insurance provided by employer/job
- ☐ My parent/guardian registered me
- ☐ No particular reason

What would encourage you to use NHS dental care?

Select as many as are relevant

- ☐ If there was an NHS dentist in my local area
- ☐ If there was a better quality of care
- ☐ A more convenient location of an NHS dentist
- ☐ Affordability of NHS treatment
- ☐ Recommendation from friends/family
- ☐ Increased treatment range
- ☐ Nothing
- ☐ Other

If other, please specify

About you



All the answers that you provide in this survey are anonymous but the below information will help to identify any specific patterns that might exist. The information will not be used to try to identify individuals, or to be passed on to any 3rd party.

The only people with access to the information you provide are Healthwatch and the members of Public Health department at Northumberland County Council who are working on the oral health needs assessment.

How would you rate your general health?

Click one of the icons



How old are you?

Select one

- ☐ Younger than 16 years old
- ☐ 16 - 24 years old
- ☐ 25 - 34 years old
- ☐ 35 - 59 years old
- ☐ 60 - 84 years old
- ☐ 85 years old or more

What is your employment status?

Select one

- ☐ Employed full time
- ☐ Employed part time
- ☐ Self-employed
- ☐ Unemployed
- ☐ Retired
- ☐ Full-time education

What is your main mode of transport?

Please click on one of the icons below



What is your postcode?

Anything else?

Are there any other comments you would like to make in relation to oral health and services for oral health that you feel have not been captured in this questionnaire?

Further to this survey, we would like to talk to residents in more depth and are looking to invite representatives of different groups for more detailed discussions. If you would like to be involved further in this process, please enter your contact details below and we will contact you in due course.

Would you like to take part in further discussions?

Click one of the icons



What is your name*?

Please type in your email address or phone number*

** These details will only be used to contact you if you would like to take part in further discussions.*



Thank you!

Thank you for taking the time to participate in this survey.

Please click Submit at the bottom of this screen to submit your responses.

If you have any questions or would like to talk to someone about this work, please contact Frederike Garbe at Frederike.Garbe@northumberland.gov.uk