

Grampian Oral Health Needs Assessment (0 - 12 years)

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Introduction

Title:

NHS Grampian Participatory Oral Health Needs Assessment for Paediatric Patients (0-12)

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Aim:

The needs assessment aims to describe the oral health of children in Grampian, establish their health needs and identify gaps in the oral and dental health services for children and make appropriate recommendations to address these.

Objectives:

- Describe the current oral health epidemiology amongst children in NHS Grampian
- Describe the current dental service provision for children in NHS Grampian
- Determine the demand for oral health and dental services for children in Grampian
- Analyse the current workforce in dental services for children
- Determine the perceptions of key stakeholders on the current model of delivering paediatric dentistry
- Identify gaps in, and between, service provision
- Make future recommendations for the delivery of paediatric dental services across NHS Grampian

The population considered within this needs assessment and rationale for exclusion:

The target population of this needs assessment will be children 0 – 12 years old resident in the Grampian area.

Secondary school children are not included in this needs assessment because key epidemiological information is only available for children in primary 1 and primary 7, with very little relevant epidemiological data available for an older cohort. The majority of oral health improvement investment is also tailored for the age group 0-12 years, so it is important to understand how this is being deployed to meet the needs of the population it is targeting.

Stakeholders who took part in the needs assessment:

Community Planning Partnership	Quality improvement officers
Integrated Joint board	Childsmile teams
Nursery representation / QIO	Health visitor / School Nurse leads
Family Nurse Practitioners	Family nurse partnership
Midwifery	Public Health Coordinators
Dental Service Managers	StR Dental Public Health
Secondary Dental Care providers	General Dental Practitioner / DPA
Public dental service leads	Senior Management Teams
Public Health consultants	NDIP Coordinator

The intended audience of needs assessment:

- NHS Grampian
- Health and Social Care Partnerships
- Local Authorities
- Education Establishments in Grampian
- Grampian Population

Definition of needs assessment

An oral health needs assessment is the process of describing the oral health of a population and targeting resources towards improving outcomes for underserved population subgroups or those most at risk of developing dental disease¹.

The process involves:

- o Establishing and describing the oral health of a population
- o Ascertaining their needs
- o Measuring the capacity of existing services to meet these needs
- o Where gaps exist, identifying new or alternative ways in which such gaps can be prioritised and filled

The health needs assessment is a “systematic method of identifying the public health, health and care needs of a population and making recommendations for changes to meet these needs”². It is important to note that this is a cyclical process that is constantly ongoing and one that must be updated regularly.

Why does Grampian need an oral health needs assessment?

NHS Grampian has a responsibility to assess if our services are meeting the needs of our population. Several factors, including an ongoing national recruitment crisis and the impact of the pandemic, have restricted access to NHS dental services nationwide, so it is essential that the impact of these factors is fully understood and accounted for in future service planning. Alongside this, the NHS Statement of Dental Remuneration (SDR) has been reformed, starting in November 2023, which is likely to impact how dental services are delivered going forward.

Definition of oral health and specific group of interest

The WHO (World Health Organisation) defines oral health as the state of the mouth, teeth and orofacial structures that enable individuals to perform essential functions such as eating, breathing and speaking and encompasses psychosocial dimensions such as self-confidence, well-being and the ability to socialise and work without pain, discomfort and embarrassment...

Oral health varies over the life course from early life to old age, is integral to general health and supports individuals in participating in society and achieving their potential³.

A child is defined as any person under the age of 18, however, for this needs assessment the focus is on children from birth until 12 years of age. Paediatric dentistry is defined as the practice, teaching and research into the comprehensive and therapeutic oral health of children from birth to adolescence, including care for children who demonstrate intellectual, medical, physical, psychological and/or emotional problems⁽⁴⁾.

Explanation of data sources and techniques used to undertake the needs assessment

This needs assessment will utilise qualitative data collected from staff who work in the Childsmile programme in Grampian, as well as quantitative information derived from the published literature, and internal NHS Grampian service data.

A participatory co-design methodology has been deployed in this needs assessment to ensure that the views of key stakeholders involved with children's oral, and general health, have an opportunity to contribute their expertise to this process. This is an attempt to take a bottom-up approach to identifying factors affecting children's oral health and to involve a variety of different opinions and knowledge in trying to find solutions to improve this going forward.

Explanation of local Engagement of stakeholders and population

Significant efforts were made to engage stakeholders and the population in this needs assessment. Staff surveys were distributed to the Childsmile teams working across Grampian to capture their views on the strengths and weaknesses of the current service provision, as well as provide a platform for them to make suggestions on how to improve this service delivery.

A stakeholder analysis was conducted to identify key partners across Grampian that have a shared interest in improving children's oral health. A short-life working group was established to contribute to a working draft of the final report, using the expertise of the group to identify any gaps or missed opportunities. A further session was then designed to offer an opportunity to discuss Grampian-wide priorities going forward on how to improve children's oral health.

Executive Summary

Burden of Disease: Over the last two decades, the number of children in P1 and P7 who have no decay experience has continued to steadily increase across the country. In 2022/23, **77.2%** of Primary 1 children in Grampian had no obvious signs of decay, which is an improvement from the previous year (**75%**). The number of children identified as having severe decay or infection had also decreased in 2022/23, from a record high of **10.4%** in 2021/22, down to **7.2%**.

The number of decay-free Primary 7 children has also steadily increased to higher the national average - at **79.7%**. Encouragingly, the number of children in this age group with severe decay or infection present has dropped to **2.2%**, however, oral health inequalities remain prevalent through Grampian, with persistently higher levels of disease, and severity of disease, in areas associated with increased socio-economic deprivation.

Dental Service Provision: Following the impact of the pandemic and ongoing recruitment and retention challenges across the sector, there are significant pressures on access to primary and secondary care dental services. A new contract reform for general dental practitioners has provided opportunities to receive enhanced remuneration for delivering preventative advice and e for children, however there is currently not enough data available to analyse trends in its uptake. Particular focus is given to the waiting list times for dental general anaesthetic (GA) and the external factors contributing to these delays to accessing care. There are currently **444** children on the GA waiting list, **301** (67.8%) have been waiting more than 12 weeks to receive their required treatment, while **162** (36.5%) have waited for more than a year. Work is ongoing to reduce this backlog and ensure children have timely access to dental care, through the hospital, public and general dental services.

Registration and Participation: Access has become a key problem for both primary and secondary care NHS dental services following pandemic. In particular, the registration rates in the 0-2 year-olds in Aberdeen City and Moray are below the national average (28.1%) at **22.9%** and **25.6%** respectively, with Aberdeenshire only marginally higher at **30.8%**. From March 2019 to September 2022, Grampian consistently had a higher percentage proportion of children engaging with NHS dental service than then national average, however registration and participation rates remain considerably lower than pre-pandemic levels.

Childsmile and Oral Health Improvement: The cessation of the Childsmile programme during the COVID-19 pandemic has resulted in a slow but consistent process of re-establishing engagement with the education sector. Uptake of the toothbrushing programme in both pre-school establishments and primary schools remain significantly below the pre-pandemic levels, however progress continues to be made to re-engage with stakeholders and overcome any barriers to delivering daily tooth brushing for children.

Toothbrushing and diet advice claims have also seen a significant drop from their pre-pandemic levels. The biggest fall in prevention provided was for the 0-2 year-old category, which is likely to be associated with the decrease in the number of children registered and participating with NHS dental services in this age group. The community engagement delivered by the Childsmile team remains a success, with **452** children referred to dental health support workers in 2022/23. The vast majority of these referrals are made health visitors, reinforcing the importance of the role they play in identifying and referring children who would benefit from the Childsmile programme.

Childsmile Team feedback: The Childsmile teams across Grampian provided feedback with many responses highlighting the availability of NHS dentists and maintaining consistent engagement with education establishments as significant barriers to delivering improvements in oral health. Work must be done to reflect on the issues raised in this feedback, to ensure equitable delivery of the Childsmile programme across Grampian.

Executive Summary – Recommendations

- 1. Improve access and participation of children in dental services particularly in deprived communities.**
- 2. Improve the uptake of the Childsmile programme in nurseries and primary schools**
- 3. Enhanced oral health promotion prior to/post general anaesthetic**
- 4. Closer collaboration of public health work streams on diet/child healthy weight and oral health**
- 5. Pre + Post-Natal Engagement (Parents and Children)**
- 6. Improved data sharing with support from Health Intelligence**
- 7. Continued focus on oral health education.**
- 8. Potential topics/areas for further research and exploration**
- 9. Tackle the wider determinants of oral health and inequality**

Common Oral Conditions in Children

Dental Caries

Dental caries is the most common non-communicable disease worldwide³. It affects 60-90% of school children⁵ and occurs when the bacteria in the mouth use sugars from food to make acids. The acidic environment in the mouth erodes the tooth, resulting in a process of demineralisation of the enamel of the tooth, which in turn causes tooth decay. This is generally “asymptomatic” (pain-free) in the early stages of the disease process, however, it can become painful as the decay spreads through the tooth and interacts with the pulp tissue that contains the nerve fibres associated with toothache.

Dental caries can be prevented by avoiding dietary sugars³, however, there is a need to provide “simple and cost-effective population-wide and individual interventions” that avoid the need for costly treatment interventions that reinforce oral health inequalities³.

Dental Trauma

Dental traumatic injuries occur frequently in children and young adults, comprising 5% of all injuries for these patients⁶. It is reported that 25% of all school children experience dental trauma⁶. The most common of these injuries in the primary dentition (children’s teeth) is known as a luxation, where the tissues, ligaments and bone that support a tooth are disrupted by the trauma. In comparison, the most commonly reported dental trauma in permanent dentition is crown fractures. Proper diagnosis, treatment planning and follow-up are important to assure a favourable outcome following any dental traumatic injury⁶.

Periodontal Disease

Periodontal disease is the 6th most prevalent disease throughout the world and is significantly linked to general well-being and a number of other health issues³.

Periodontal disease is the inflammation of the gums and surrounding tissues. It is caused by bacteria accumulating in the gum surrounding a tooth, which reacts with dietary sugars to release bi-products that cause degeneration and loss of the gum and bone tissue around the teeth. Early signs include redness of the gum line and bleeding on brushing or flossing. As the disease progresses, the structures around the tooth can become irreparably damaged, which leads to the loosening or loss of the tooth⁷.

Periodontal disease can be prevented through good oral hygiene and the removal of this harmful bacteria before it is allowed to build up and aggregate. Regular use of tooth brushing and interdental cleaning is the best way to disrupt these accumulations of bacteria around the teeth and gums and prevent periodontal disease⁷.

Malocclusion / Orthodontics

Malocclusion is a technical term for teeth not being aligned in the position they are supposed to be, which can impact the functionality and aesthetics of a patient’s teeth. Orthodontic treatment involves wearing braces (removable and/or fixed) to correct these malocclusions and the success of this treatment is heavily dependent on the compliance levels of the patient. The presence of braces increases the surface area available for bacteria in the mouth to cause dental disease, so patients must maintain excellent oral hygiene throughout this treatment.

Population – Geographic Distribution and Demographics

Grampian Population Overview

In 2021, the Scottish Population was approximately 5,479,900. Of this number, 12.3% are children, aged 0 – 12, equating to a total of 671,982 ⁸.

At a local level, the Grampian population is 586,530, with a higher percentage of children (13.8%) than the national average. This translates to a total of 81,110 children in the 0 – 12 age bracket⁹.

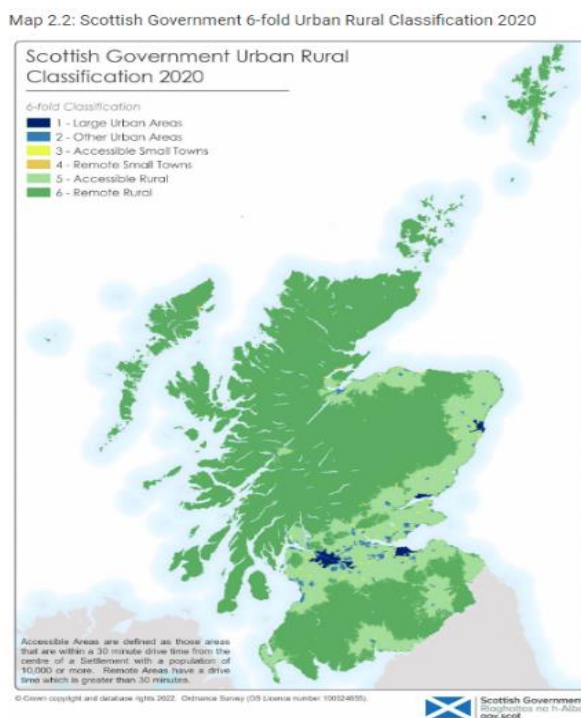
Aberdeenshire is the largest HSCP (Health & Social Care Partnership) by geographical area and also has the largest population of children aged 0-12, with 38,991 (48%). Aberdeen City is considerably more densely populated, with 29,583 (36.5%) children spread across a significantly smaller area, while the 12,536 (15.5%) children aged 0-12 live in Moray⁹.

Urban and Rural Classification

In Scotland, more than 81% of the population stays in urban areas (with a population of more than 3000). These areas cover less than 6% of Scotland’s land area and are predominantly concentrated in the central belt around Glasgow and Edinburgh. Figure 1 highlights that Grampian has a diverse population demographic. In both Moray and Aberdeenshire, there are pockets of areas known as “other urban areas” where there are settlements of between 10,000 – 149,999 people, however, the majority of the population stays in areas categorised as accessible rural and remote rural¹⁰. In contrast to this, the main density of the population in Grampian is based around Aberdeen City.

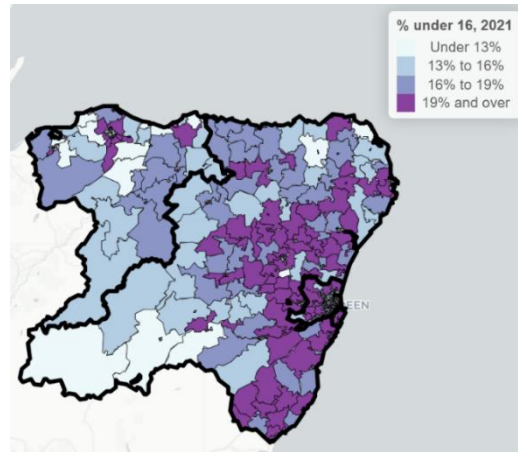
Appendix 1 shows the Scottish Government 6 Fold Urban Rural Classification which categorises areas in Scotland depending on their population size.

Figure 1: Map of Scottish Government Urban Rural Classification 2020 ¹⁰



This demographic spread is reinforced in Figure 2, below, which illustrates the density of child population under 16 spread across Grampian. Aberdeen City and the surrounding areas in North and South Aberdeenshire have the highest percentage of children, with the majority of these areas being comprised of 19% or higher children under 16 years old.

Figure (2): Percentage of Population under 16 across Grampian ⁶³

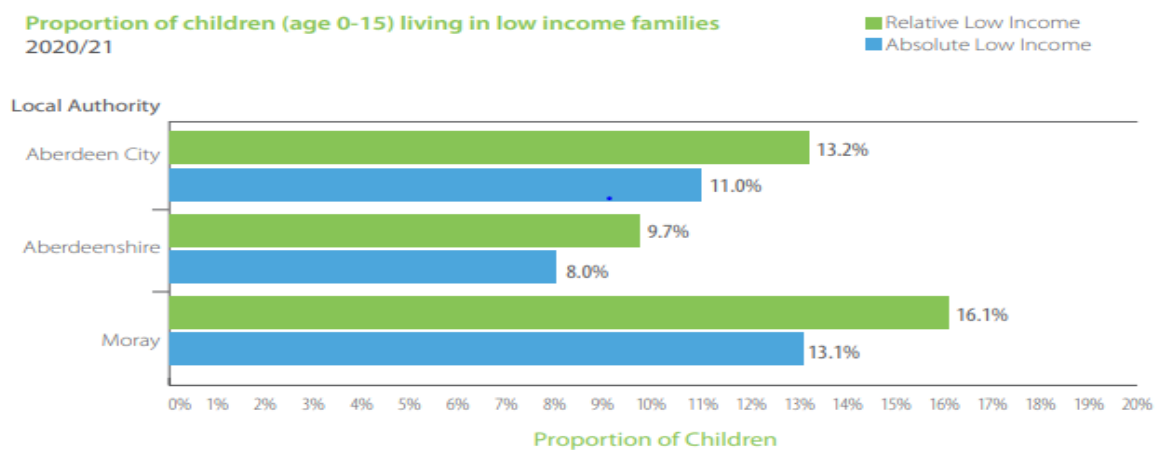


The population density across Grampian varies significantly. The population of Aberdeen City is 227,430 with a relatively high population density of 1226 people per square kilometre. In contrast to this, Aberdeenshire has a larger population of 262,690 but a population density of only 42 people per square kilometre. Moray has a similar population density to Aberdeenshire – 43/km² – with a population of just 96,410 - illustrating the stark demographic difference between the rural and urban areas in Grampian¹¹.

Deprivation in Grampian

In Grampian, 1 in 8 children are living in poverty¹². Figure 3 shows the proportion of children aged 0-15 living in low-income families across the three Health and Social Care Partnerships. Moray recorded the highest level of both relative low income (16.1%) and absolute low income (13.1%) in Grampian.

Figure 3 – Proportion of children living in low-income families in Grampian, 2020/21 by Local Authority Area ¹²



In general, Grampian is a relatively affluent area of Scotland, with the Midssocket area in Aberdeen ranked the second least deprived in Scotland in the 2020 Scottish Index of Multiple Deprivation (SIMD)¹³. A total of 116 areas fell into the category of least deprived 10% in Scotland, however it is important to note that this has changed slightly since 2016, with several areas slipping down the league table of the most deprived resulting in a reduction of those ranked “most affluent”¹³.

While it is positive that there are only 20 areas in Grampian that are ranked in the 15% most deprived in the country, there is a significant demographic gap between the richest and poorest parts of Grampian. Several factors influence this, including the impact of rural locations across the health board and the over-representation of ethnic minorities in deprived areas¹³. On average around a quarter (**23%**) of people in Grampian’s top ten most deprived areas were ethnic minorities – which increases to nearly a third (**32%**) in the Woodside area of Aberdeen City. In contrast to this, less than 15% of people in the ten most affluent areas in Grampian were from an ethnic minority¹⁴.

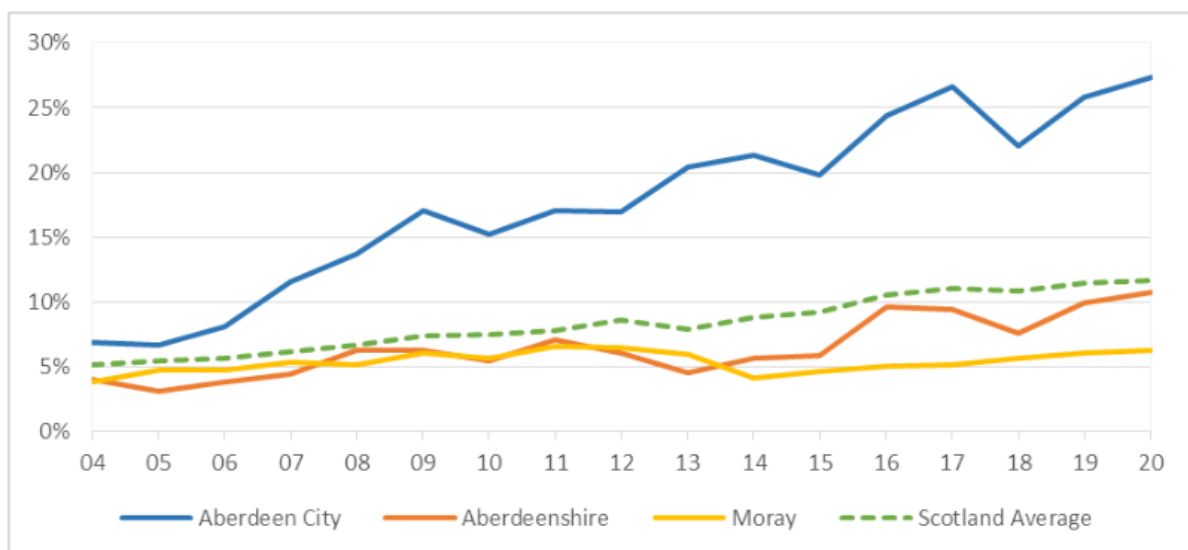
Ethnicity

The annual pupil census records data for Scottish schools and provides more precise figures than the Office for National Statistics population estimates, if only for children and young people. As shown below, schools in Aberdeenshire and Moray have smaller proportions of ethnic minority pupils than the Scottish average, while Aberdeen City has a much higher proportion.

Between 2007 and 2019, the proportion of births to non-UK-born mothers in Aberdeen increased from just under a quarter to just over a third (23% to 36%). During that period, the average in Scotland as a whole increased from 11% to 18%, with figures in Aberdeenshire and Moray slightly lower¹⁴.

Figure 4 also highlights that the proportion of ethnic minority pupils has been rising in the past decade, from 19% to 33% in Aberdeen City, 6% to 11% in Aberdeenshire and 5% to 9% in Moray, while there has been an increase from 9% to 15% across Scotland as a whole¹⁴.

Figure 4 – Ethnic minority per cent of population 2004 – 2020¹⁵



Burden of Disease / Prevalence of Dental Disease

The burden of dental disease for children in Scotland is determined through the National Dental Inspection Programme, NDIP. This programme carries out a basic inspection of the oral health of all children in Primary 1 and Primary 7 – with a detailed inspection being carried out of either Primary 1 or Primary 7 children in alternate years.

These year groups are selected to catch key epidemiological data from children as they enter into local authority schools (P1) and just before they move into secondary education (P7). In a basic inspection, pupils are separated into 3 categories depending on the findings of the inspection, and parents receive a letter home to inform them of these findings.

If parents receive an **A letter**, they should arrange to see the dentist as soon as possible, if the child has not had a recent appointment, on **account of severe decay or abscesses**. Receiving a **B letter**, they should arrange to see the dentist in the near future, if the child has not had a recent appointment, on **account of evidence of current or previous decay**. If parents receive a **C letter**, this indicates there is no obvious decay experience – which equates to no obvious decayed, missing or filled teeth. However, the child should continue to see the family dentist regularly.

P1 Basic inspection in 2021/22

Due to the impact of Covid-19 restrictions and challenges accessing schools during this period, only a basic inspection of children in primary 1 was able to be carried out in 2021/22. During this inspection, there was a spike in the number of children identified as having severe dental disease or infections present at screening, recording over 10% for the first time since 2007/08.

Alongside this, there was a progressive reduction in the number of children with evidence of current or previous decay experience (B letter) to 14%, which is the lowest average it has ever been in Grampian since NDIP started.

The number of children with no decay experience was also slightly higher than the national average (73.1%), however, it has plateaued around 75% over the last few years¹⁶.

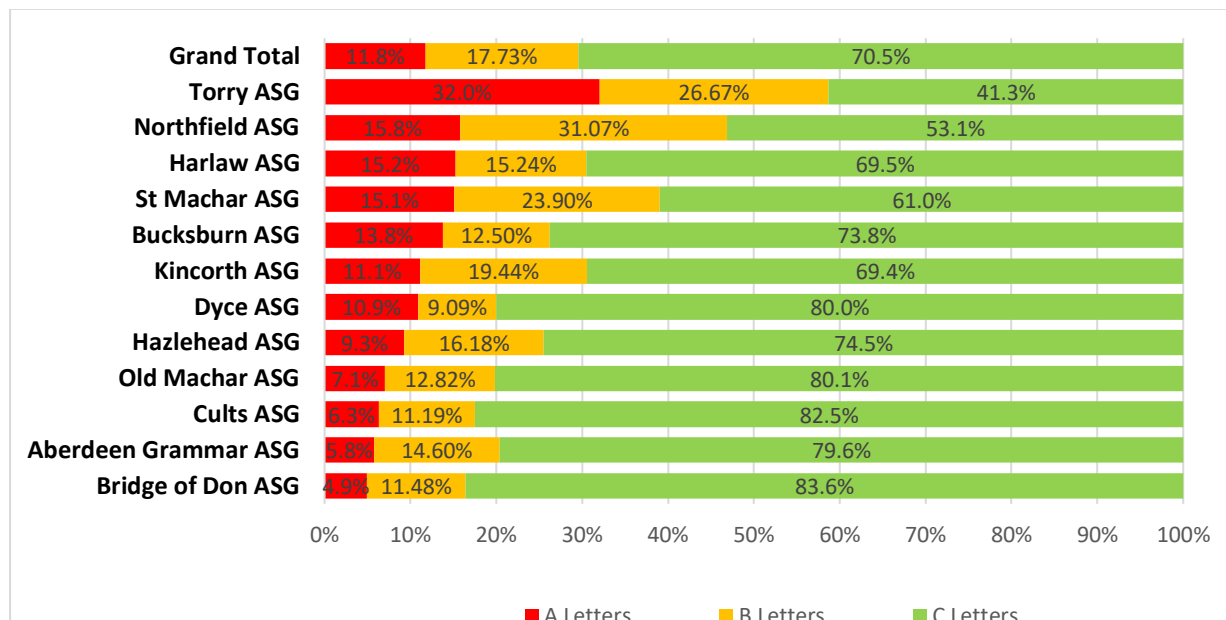
Aberdeen City

There is a wide-ranging prevalence of dental disease in the different associated school groups (ASGs) within Aberdeen City. Many of these differences appear to be linked to the levels of deprivation in a particular area, with the most deprived areas reporting significantly higher levels of children with evidence of severe dental disease or infections in comparison to more affluent areas.

One important outlier is Torry ASG (SIMD 1) where the majority of children were reported to have evidence of active or historic dental disease. 32% of children in this ASG received an A letter, indicating severe disease or an abscess present at the time of screening and a further 26.7% had some evidence of current or previous decay experience. This meant in an area of high socio-economic deprivation, only 41.3% of children were assessed as having no evidence of dental disease on inspection.

In contrast, Bridge of Don ASG (SIMD 5) reported only 4.9% as having severe disease or an infection present on inspection, while 83.6% of children received a C letter confirming there was no evidence of obvious decay experience. This is over double the amount of decay-free children in Torry.

Figure 5: Analysis of Category letters by Aberdeen City ASG's – Primary 1, 2021/22 ¹⁶



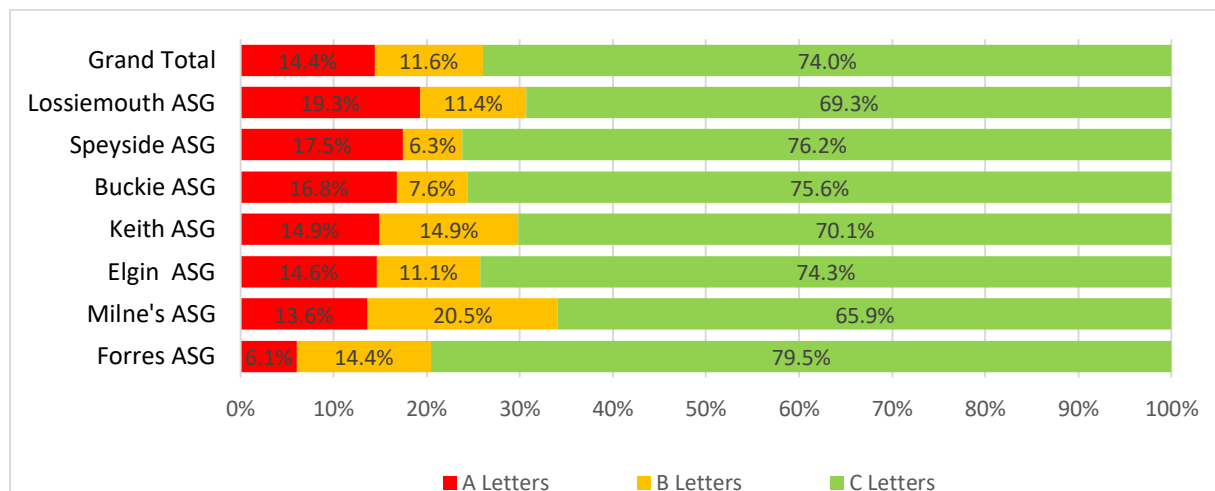
Moray

14.4% of children in Moray had evidence of severe dental disease or infection present at the time of inspection – receiving an A letter. This is considerably higher than the national average in Scotland, which was 9.7%.

Children in Lossiemouth ASG recorded the highest levels of A letters at 19.3%, while Forres ASG recorded the lowest at 6.1% of children in this category.

On inspection, 74% of children were identified as being decay-free, only slightly below the Grampian average (75%). It is important to highlight the variability of oral health inequalities across the area, with Milne's ASG recording only 65.9% of children as decay-free, while in Forres ASG it was 79.5%.

Figure 6: Analysis of category of letters by Moray ASG's – Primary 1, 2021/22 ¹⁶

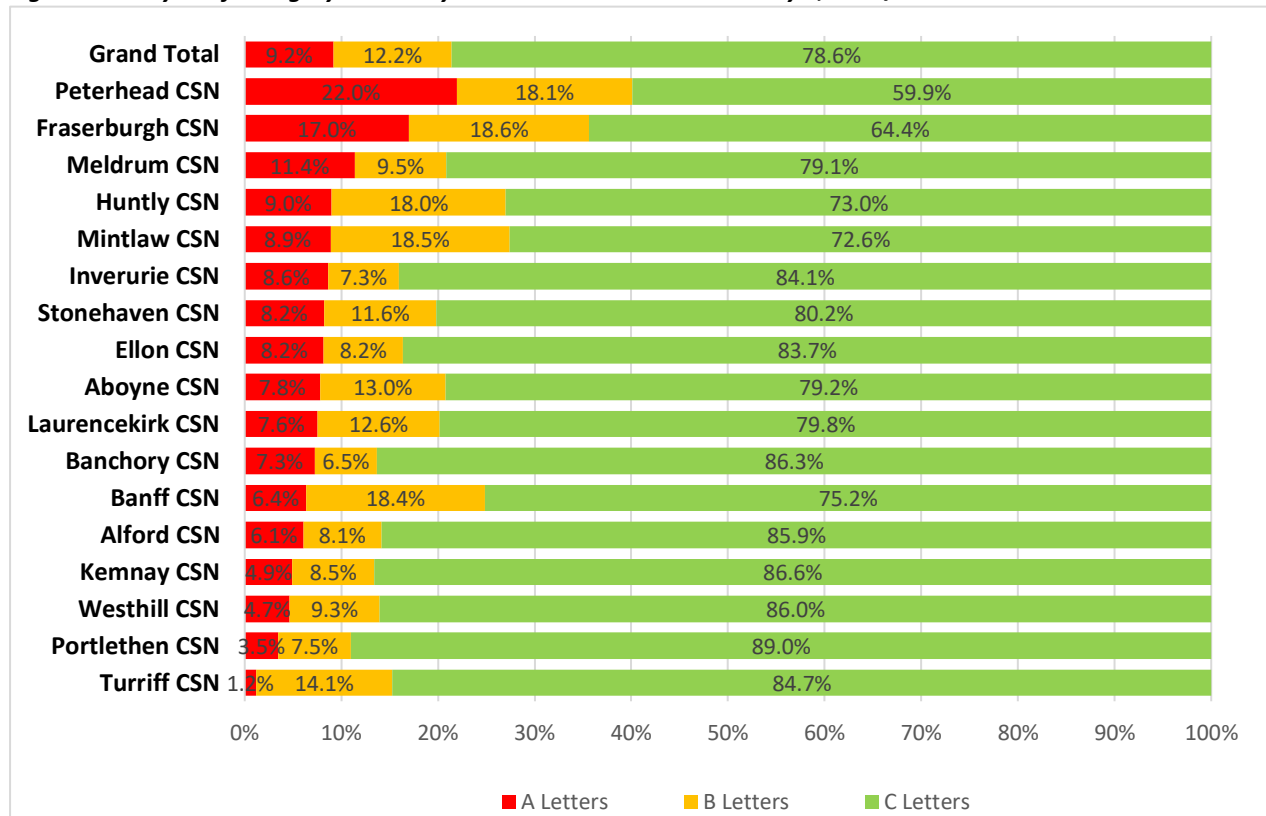


Aberdeenshire

In 2021/22, the majority of Community School Networks (CSNs) within Aberdeenshire reported a higher proportion of primary 1 children with no evidence of dental disease (C letters) than the national average in Scotland (73.1%).

Two notable outliers within this were Peterhead (59.9%) and Fraserburgh (64.4%). However, both CSNs have recorded an improvement in the number of C letters distributed from 2019, which is in contrast to the general trend in the majority of CSNs in the area and these improvements should be celebrated.

Figure 7: Analysis of Category Letters by Aberdeenshire CSN's – Primary 1, 2021/22 ¹⁶



P1 Basic Inspection in 2022/23

The ongoing recovery of services following the pandemic has facilitated more access to schools, increasing the number of children who were able to be inspected. In 2022/23, a basic inspection was carried out on 6,502 primary 1 children in Grampian, which is 80.2% of the total population.

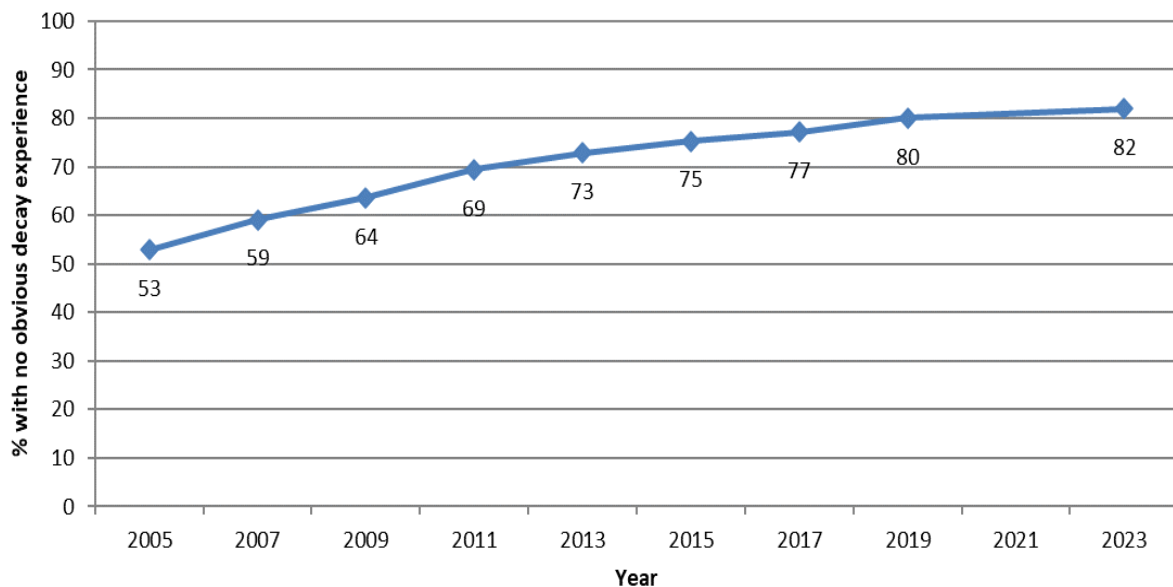
77.2% of these P1 children were decay-free on inspection, which is an improvement from 2021/22 (75%). The number of children with evidence of current or historic decay experience increased from 14% in 2021/22 to 15.6%.

However, it is important to highlight that the number of children identified with severe decay, abscess or infection at the time of inspection was down to 7.2% from 10.4% in 2021/22.

Primary 7 Detailed Inspection

Across Scotland there was a sharp improvement in the number of P7 children with no obvious decay experience from 2005 to 2013, increasing from 53% to 73%. However, since 2014 there has been a more gradual improvement with 82% of P7 children being decay-free in 2023. Figure 8 highlights this below:

Figure 8: Trends in the % of P7 children with no obvious decay experience in Scotland; 2005 – 2023 ¹⁷



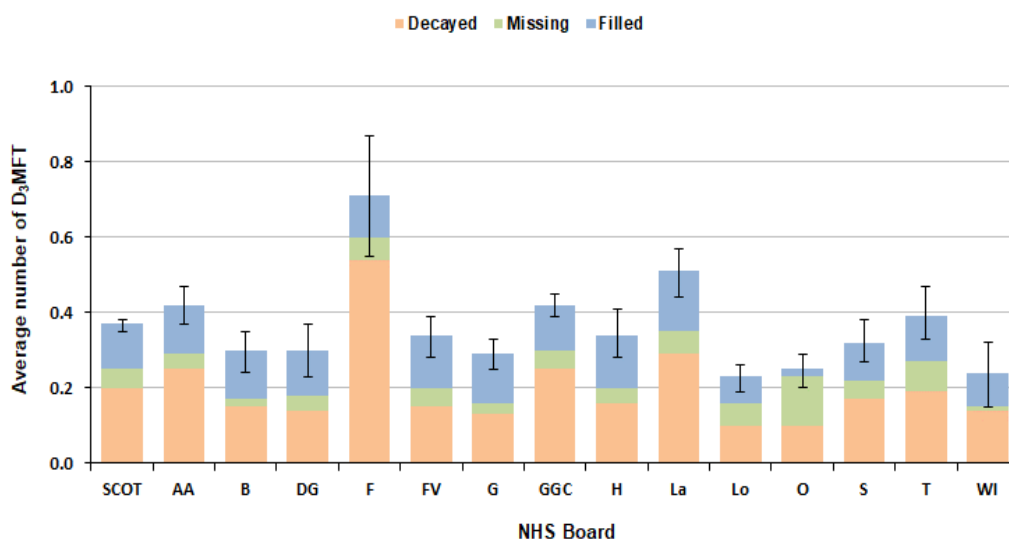
While there has been a plateau in the rate of improvement for the number of children with no obvious decay experience in Scotland, there has been an increase of 2% from 2019 which is encouraging.

In 2022/23, the percentage of P7 children without decay experience in NHS Grampian is above the national average, sitting at 85%. There is still a small variation in these statistics across the different health and social care partnerships within the health board. In Aberdeen city, 85.5% of children were decay-free, in Moray this number was 85.3% however in Aberdeenshire only 84.1% fell into this category.

D³MFT, otherwise known as Obvious Decay Experience – is calculated as the sum of teeth which have decayed into dentine (including teeth with fillings which require further treatment), filled teeth and teeth that are missing (extracted) due to decay.

The average DMFT, which identifies the number of decayed, missing and filled permanent teeth of the population, is also lower in Grampian (0.29) in comparison to the Scottish average (0.36), as highlighted in Figure 9 on the next page.

Figure 9: Mean number of obvious decayed, missing and filled permanent teeth (D3MFT) of P7 children in 2023 in Scotland; by NHS Board ¹⁷



While there has been an improvement in the number of children with no decayed missing or filled teeth, it is important to highlight the prevalence of inequalities linked to deprivation, as shown in Table 1. Just over 70% of children in the most deprived areas in Grampian have no obvious decayed, missing or filled teeth, in comparison to 89% of children in the least deprived areas.

Table 1: SIMD breakdown of DMFT (>0 and <0) in Primary 7 children in Grampian ⁶¹

Health Board 2020 SIMD Quintile	dmft>0	dmft=0
	%	%
SIMD 1 - Most Deprived	29.6%	70.4%
SIMD 2	23.9%	76.1%
SIMD 3	21.4%	78.6%
SIMD 4	15.1%	84.9%
SIMD 5 - Least Deprived	11.0%	89.0%

P7 Basic inspection in 2022/23

In 2022/23 a basic inspection was also carried out on 6,843 P7 children in Grampian, which is 79.5% of the total population of P7 children in the health board. Results from this inspection are positive, indicating that 79.7% of P7 children are decay-free, which is higher than the national average of 75.2%⁵².

A total of 18.1% of children received a B letter, indicating the presence of current or historic decay, while only 2.2% of children were identified as having severe dental disease, abscess or infection at the time of inspection. Both of these scores are below the national average for A letters (2.7%) and B letters (22.2%)⁵².

Determinants of Oral Health and Common Risk Factors

Deprivation

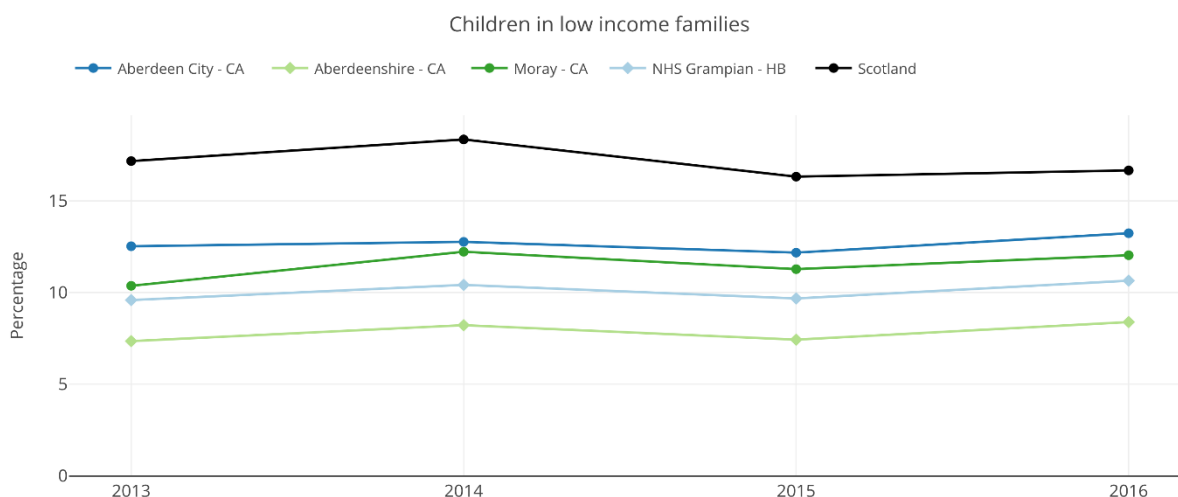
Multiple studies link oral health to an individual's socio-economic status, with children from a more deprived background consistently being shown to have higher levels of dental disease⁵. This strong association between levels of dental decay and deprivation is linked to many other risk factors that harm dental health, including diet, smoking, access to healthcare services and education about prevention.

Poor oral health can impact a child's ability to sleep, eat, speak, play and socialise with other children¹⁸, as well as causing pain, and infections. These factors can lead to children receiving impaired nutrition, which can impact overall growth and development, and ultimately deprivation has also been shown to be associated with a lower BMI and a higher rate of decayed, missing and filled teeth¹⁸.

Factors like poor quality living standards, low levels of education, poverty and consumption of food and drinks that contain free sugars are all associated with increased levels of deprivation as well as increased dental disease¹⁹.

In 2016, 10.6% of children in Grampian were from a low-income family, which is lower than the national average of 16.6%, as shown in Figure 10. While it is positive that all 3 HSCPs have a lower percentage of children in low-income families than the national average, there are stark oral health inequalities experienced by children in these areas of higher deprivation²⁰.

Figure 10: Children in low-income families; Scotland, Grampian, Aberdeen City, Aberdeenshire + Moray ²⁰



Cost of Living Crisis

Public Health Scotland also reports that the current ongoing cost of living crisis is likely to result in major health inequalities across the population. Due to the scale of the crisis, the whole population will likely be impacted, however the most vulnerable in society are predicted to be impacted and suffer the most²¹. The median weekly earnings in 2022 were around £80 lower per week than they would have been had earnings growth followed its long-run trend after 2020. This is likely to add further strain on families who are already struggling to cope.

Impact of Covid 19

The advent of the Covid-19 pandemic brought about an unprecedented cessation of dental services across Scotland and the rest of the world. Public health measures to reduce the impact of the virus were introduced in March 2020 and the infection and prevention control measures were only de-escalated in dental practices in April 2022. These restrictions limited the number of patients that dentists were able to see each day, which resulted in a backlog of patients requiring examinations and treatment. By May 2022, primary care dental services had not completely returned to their pre-pandemic levels of patient contacts and some practices are continuing to face challenges in achieving this²².

This has resulted in patients waiting longer to receive non-emergency dental care, which has led to an increase in the prevalence and severity of dental disease across the population¹⁷. Other factors, like lockdowns, led to an increase in consumption of high sugar-containing foods⁴¹ as well as disruption of oral hygiene routines.

Diet and Child Healthy Weight

There is an association between children's weight and dental caries prevalence and severity. Children with a healthy weight are less likely to experience dental caries than those who are overweight²³.

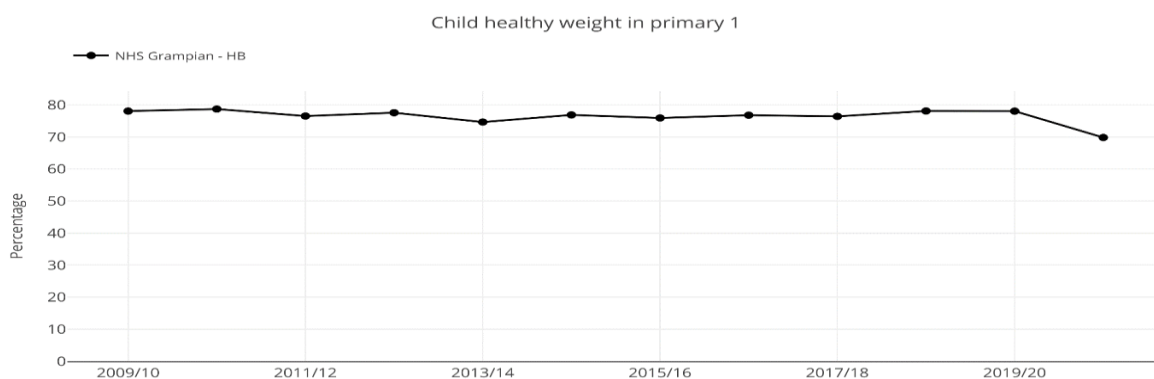
Childhood obesity and dental caries are also associated with numerous physiological and psychological implications such as a negative impact on growth and low self-esteem²⁴, as well as an increased risk of developing health conditions like type 2 diabetes.

Both obesity and dental caries are complex and multifactorial conditions. The major link between both is diet-related risk factors, such as poor food choices, dietary habits and high-frequency consumption of sweetened junk food²⁵. This poor diet and excessive sugar consumption can, over time, lead to obesity as well as an increased risk of dental caries and periodontal disease²⁵.

Moreover, children living in more deprived areas of the country are acutely affected by these social determinants of health, and as such, are twice as likely to experience dental decay and childhood obesity²⁶.

One-third of children aged 2 to 15 in Grampian are on an overweight or obese trajectory. Almost a quarter of five-year-old children are overweight and one in ten are obese. This means 11,000 overweight and 15,000 obese children in Grampian²⁸. A total of 10.6% of children in Grampian were at risk of developing obesity in 2021/22, compared to a national average of 11.7%

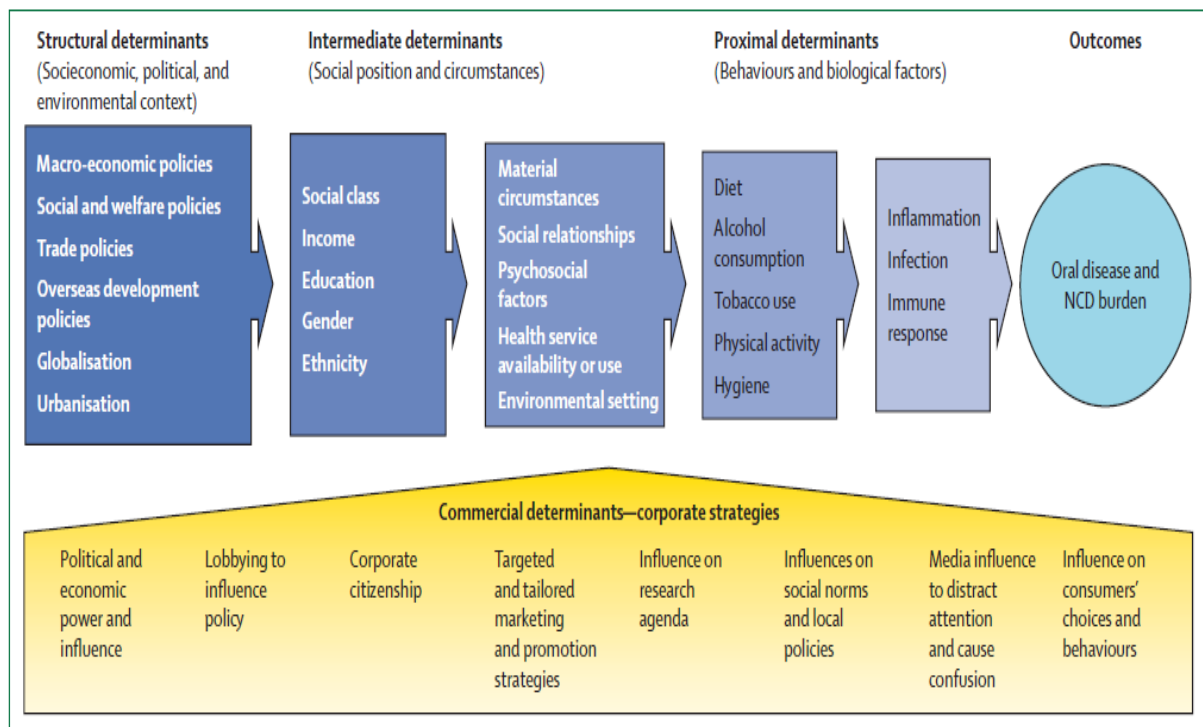
Figure 11: Child Healthy Weight in Primary 1 in NHS Grampian ⁶²



Commercial determinants of health

Commercial actors can make a significant positive contribution to society and influence a range of factors that affect the health of the population. However, an increasing number of the actions of these commercial bodies are harming human health and the planet, as well as causing significant inequity and inequality around the world²⁸. The biomechanical approach to prevention prevails, favouring clinical preventive interventions and chairside oral health advice instead of population-wide, upstream strategies. There is now a growing understanding of the need to move away from clinically focused policy initiatives towards policies that address the social determinants of health and the risk factors shared between oral diseases and other non-communicable diseases²⁹. One of the biggest factors affecting the oral health of children is the power and influence that “Big Sugar”²⁹ has on their day-to-day diet. Through effective marketing, persistent lobbying, corporate responsibility strategies (that enhance the acceptability of sugar products through sponsorship at sporting events) and globally extended supply chains, a small number of companies can exercise a significant amount of influence over the ingredients that make up the diet of a large percentage of the population²⁹. Figure 12 (below) highlights how these social and commercial determinants of health interact with each other to produce a significant oral and non-communicable disease burden among the population.

Figure 12 – Social and commercial determinants of oral diseases²⁹

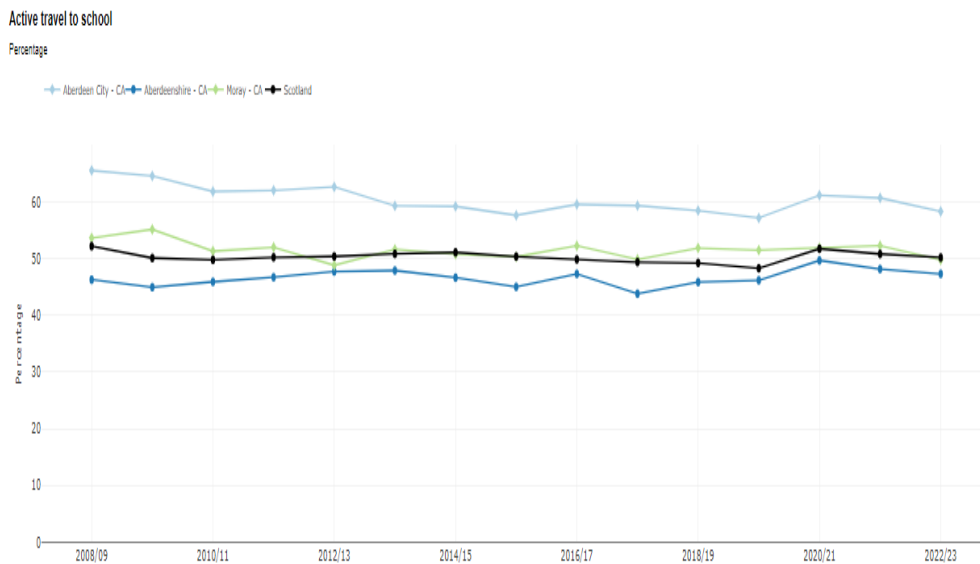


Impact of rurality

Rurality has a significant impact on a patient’s ability to access dental care and ultimately to maintain a healthy mouth³⁰. These areas are disproportionately affected by oral disease – with higher levels of periodontal disease, decay and the loss of teeth³⁰. These issues are often heightened by barriers to accessing dental services and having limited opportunities to engage with health promotion to improve the prevention of oral diseases.

Figure 13 shows the pattern of active travel to school in the 3 different HSCPs within Grampian, in comparison to the Scottish average. Rurality plays a role in how feasible it is for children to travel to school without needing to rely on cars or buses, where travelling longer distances to reach education is more common. Figure 13 also highlights that the more rural areas of Grampian, namely Aberdeenshire and Moray, are just below the average for Scotland in terms of active travel to school, however in contrast Aberdeen City is nearly 10% higher, with 58.3% of journeys to school involving active travel (31 – ref missing).

Figure 13: Active travel to School: Aberdeen City, Aberdeenshire, Moray and Scotland ³¹



The need to travel longer distances when living in a rural community also affects a patient’s ability to access primary and secondary healthcare services, including dental care. This often means there is a greater responsibility on clinicians who work in rural locations to be skilled across a wider variety of procedures, as patients rely on them to find intermediate solutions before being referred for longer distances for specialist care. This expected delay in treatment due to the distance required to travel to access care could be managed through flexible pathways and effective self-management – particularly in trauma situations. This emphasizes delivering effective education opportunities to both patients and the dental profession, to ensure that everyone knows the best and most appropriate way to access care, as and when they need to.

Education

Education has a significant impact on health and subsequently on the opportunity for children to make positive life choices. The proportion of children leaving school with one or more qualifications at SCQF Level 6 (Scottish Credit and Qualification Framework) has increased in Grampian from 49% in 2009 to 60% in 2015²⁷.

Two main oral health programmes regularly engage with the education sector. The National Dental Inspection Programme (NDIP), carries out a basic inspection of the oral health of all children in Primary 1 and Primary 7 – with a detailed inspection being carried out of either Primary 1 or Primary 7 children in alternate years. There is a statutory requirement for schools to engage with this programme and it is run under the auspices of the Scottish Dental Epidemiology Co-ordinating Committee on behalf of NHS Boards

The Childsmile programme also engages with schools independently of NDIP and delivers improvements in children's oral health through a universal supervised tooth brushing scheme and targeted fluoride varnish applications to children in the most deprived areas. Childsmile is a national oral health improvement programme, funded by the Scottish Government that relies on schools engaging with local Childsmile teams to allow access to provide oral health advice and support with tooth brushing and fluoride varnish applications.

It is well established that oral health promotion interventions from an early age are effective at reducing the prevalence and severity of dental disease³²⁻³⁴. The WHO has identified schools as ideal settings to promote oral health, which Bramantoro built on by identifying positive results from programmes run in schools that included children, parents and teachers. Engagement with the education sector has been vital for the success of the Childsmile programme, and access to education establishments remains one of the biggest challenges to continue improving the oral health of children going forward.

Combined with guidance on healthy eating in schools³⁶, consistent engagement with oral health messages at an early age remains one of the best ways to embed positive lifelong dental health habits for children.

Children with additional support needs

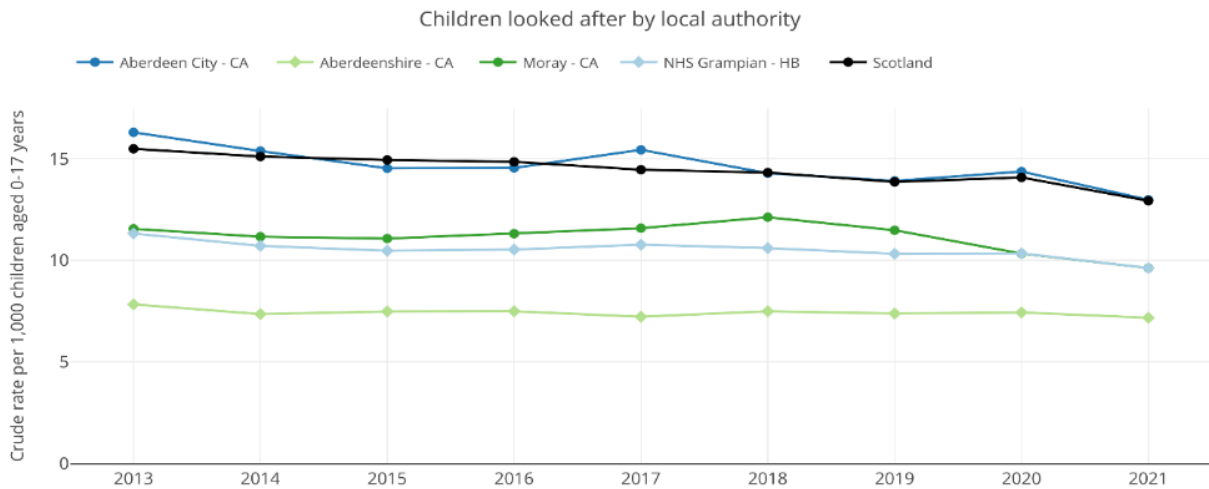
Children with additional support needs (ASN) are often classed as children with intellectual disabilities, autism or other conditions that affect their physical ability to maintain a healthy mouth. Sherriff et al, confirmed that ASN children have an increased risk of developing caries in comparison to children with no ASN³⁷. In particular, they also highlight that children with intellectual disabilities have higher rates of teeth extracted under general anaesthetic. This is often a consequence of additional barriers to children with ASN accessing dental care, as well as children with intellectual disabilities or autism being less likely than their peers to receive preventative treatments like fluoride varnish, oral hygiene instruction or dietary advice.

Looked after children

Looked-after children are defined under the Children (Scotland) Act 1995, as those in care of their local authority, which can sometimes be referred to as a corporate parent³⁸. The Scottish Government lists the following reasons that many children may become looked after Facing abuse or neglect at home, they have disabilities that require special care, they are unaccompanied minors seeking asylum – or have been illegally trafficked into the UK, or they have been involved in the youth justice system.

“Looked after” children share the same health problems as the general population of children but to a more severe extent. Children who have been in care tend to have a higher level of dental disease and oral care neglect than children who have not⁵, with one study finding that they are less likely to visit a dentist regularly⁵. Multiple additional social determinants of health acutely affect “looked after” children, in addition to challenging socio-economic barriers to accessing appropriate healthcare. The physical needs and health of these children can often be overlooked due to the multitude and complexity of the issues that they face, compounding their vulnerability and the need to advocate for their rights.

Figure 14: Children looked after by local authority; Grampian, Aberdeen City, Aberdeenshire, Moray, Scotland³¹



Unplanned moves to different areas in the middle of existing dental treatment plans can impact the confidence and trust that “looked after” patients have with their dentist, as well as some general dentists being unwilling to start complex treatment plans when there is uncertainty about whether the child will be able to complete the treatment. Because these patients are coping with a significant number of very complex social issues, oral health is often not prioritised, which further compounds the multitude of factors they have to overcome to maintain a healthy mouth.

Ethnicity

As highlighted in the previous section, Grampian has seen an increase in the number of different ethnic groups that comprise its population and the trend indicates this diversity is only going to continue to increase in the future.

Different cultures and ethnic groups have a wide range of attitudes towards oral health and accessing dental treatment. A wide variety of factors including dental attendance, frequency of sugar added to hot drinks, decay and filling experience, diet and extraction experience are all known to vary between different ethnic groups in the UK⁴⁰.

While the proportion of children born to families from an ethnic minority has been increasing, there is very little data available on the makeup of these populations in Grampian, including their preferences around maintaining a healthy mouth. More work needs to be done to understand the demographics of the existing population as well as understand the oral health behaviours and preferences of each community, to ensure their needs are met by any future service provision.

Breastfeeding

The WHO recommends exclusive breastfeeding for the first six months of an infant’s life, with continued breastfeeding alongside complementary foods, up to two years of age and beyond⁶⁵. Breast milk is the only food or drink babies need for around the first 6 months of their life, with first-stage formula milk the only suitable alternative to breast milk³⁹.

Multiple studies have identified that breastfeeding in infancy may protect children under the age of 1 against dental caries⁴¹⁻⁴⁵. There is a lack of rigorous evidence around oral health and breastfeeding for children over 12 months, with the majority of studies not investigating confounding factors like; the consumption of other food and drinks that can cause tooth decay, toothbrushing practices, the frequency of nocturnal feeding and the eating habits of the mother.

As of September 2023, 68.6% of babies in Scotland had ever breastfed from birth and by the 6-8 week review, overall breastfeeding was at 41.8%. In 2023, the number of babies that have ever breastfed at birth in Grampian is 76.8% and at 6-8 week review it is 51.2%⁶⁸.

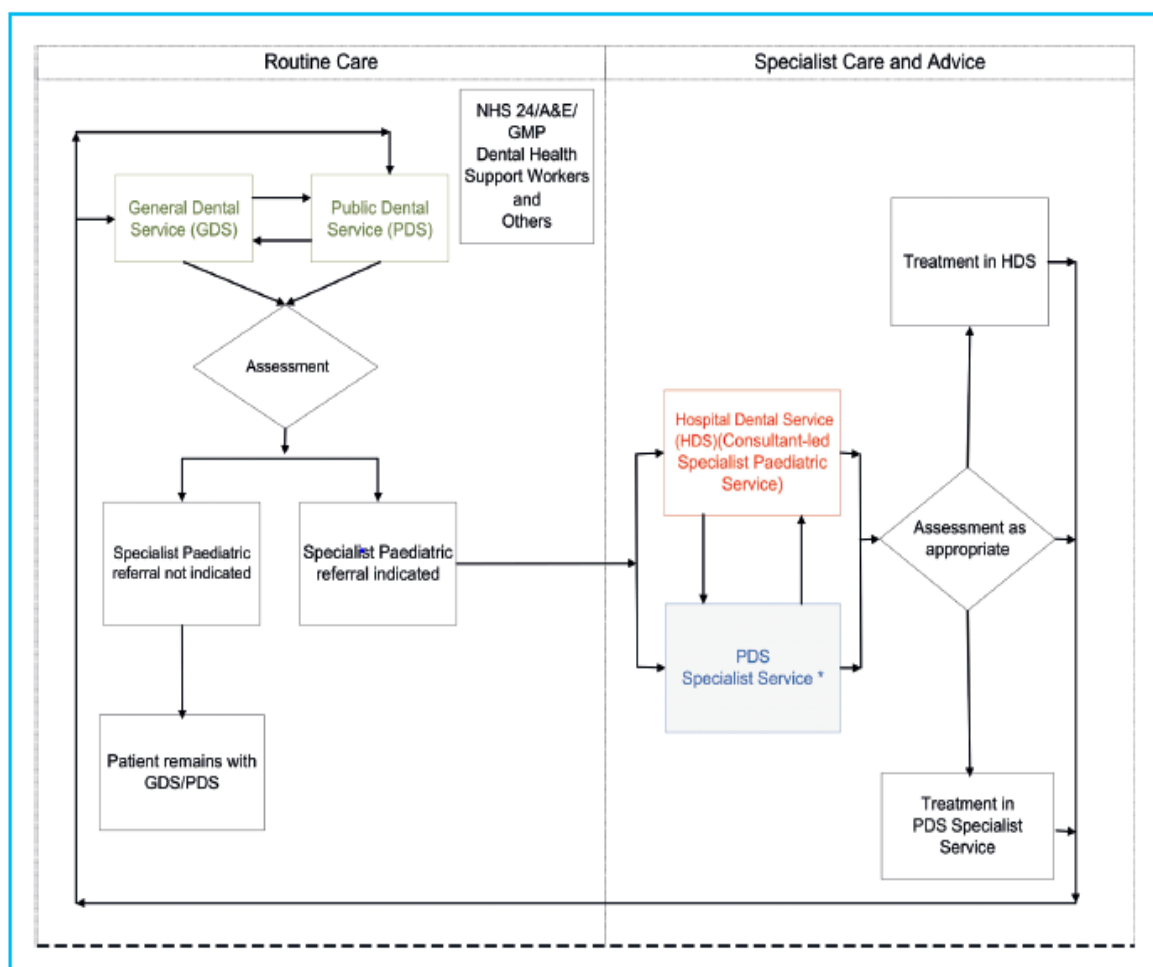
NHS Grampian has embedded the UNICEF Baby Friendly Initiative Standards and all relevant services are currently working towards their Gold Sustainability Award.

In addition to appropriately trained healthcare staff and the infant feeding specialist service, NHS Grampian utilises the skills of a network of breastfeeding peer-support volunteers to deliver antenatal and postnatal support for mothers and their wider network.

Dental Service Provision

Oral health care is delivered to children in three settings: General Dental Service (GDS), Public Dental Service (PDS) and the Hospital Dental Service (HDS). Figure 15 (below) outlines the gold standard service delivery model in Scotland, as identified in the SDNAP (Scottish Dental Needs Assessment Programme) Oral Health and Dental Services Needs Assessment Report 2017.

Figure 15: Current general service delivery model in Scotland (patient journey pathway) ⁴⁶



The following section of the needs assessment summarises the current service delivery model in Grampian and aims to identify any gaps in service provision against the gold standard outlined above.

General Dental Service Provision (GDS)

The vast majority of dental care for children in Scotland is delivered by general dental practitioners and dental care professionals in the GDS. Dentists treat children under an item of service fee as determined by the Statement of Dental Remuneration (SDR) and are supplemented with a capitation fee for having the patient registered with them. Most children who require routine preventative and restorative care receive their treatment in this environment, usually as part of the family's regular

dental visits. There is also a significant number of children whose needs are not met entirely within the GDS, as the environment in many practices is tailored to providing care for adult patients and very few practices invest in specifically child-friendly facilities.

The SDR dictates the remuneration that is available to dental practitioners undertaking preventative and restorative treatment for children. The current SDR is going through a period of significant reform, with the updated version to be released in November 2023. The existing model of providing care can present significant challenges to a practitioner when faced with a young or anxious child as they feel the time involved in reassuring and persuading young patients to cooperate and accept treatment is not felt to be recognised within the current fee structure. A small number of general dental practitioners (GDPs) also utilise the services of hygienists/therapists to facilitate the treatment of their child patients, however, this is a much underutilised resource.

As well as delivering treatment and preventative advice themselves, GDPs also make onward referrals for dental treatment. These referrals are made to the Public Dental Service (PDS) or Hospital Dental Service (HDS), depending on local availability and the reason for the referral.

Lifelong registration was introduced in April 2010 and it is recognised that registration with a GDP is not a direct indicator that the patient is accessing dental care. To address this, the measure of “participation” is used to show the number of patients who have attended the GDP in the last two years.

[Public Dental Service \(PDS\)](#)

The public dental service was established on 1st January 2014, merging the salaried dental service with the community dental service to provide dental services for people who cannot access care from an independent dentist.

The PDS provides a range of services in a variety of different settings, including community, custodial and secondary care settings. The main patient base of the PDS includes patients with special care needs, such as mental health conditions or physical disabilities, residents in long-stay care and patients referred in for specific treatment.

Specifically related to children, the PDS manages patients with additional support needs, including learning disabilities and physical disabilities, medically compromised patients, migrants and children with severe dental anxiety and phobia⁴⁶.

Referral to Public Dental Service

Paediatric referrals to the Public Dental service are made by clinicians in the GDS for a variety of reasons. The majority of the referrals into this pathway are for the management of caries in patients with anxiety around attending the dentist. Other common reasons for referral include poor cooperation, sedation, degree of medical or dental complexity, trauma and management of children with additional needs. The SDNAP needs assessment in 2017 identified that 68% of GDPs indicated they had referred child patients to visit their local PDS⁴⁶.

General dental practitioners are encouraged to attempt treatment and deliver preventative advice wherever possible and appropriate, however, the age of a child, their cooperation or the extent of their dental anxiety can act as a barrier to delivering this care in practice. Therefore, referrals can be made to the PDS if procedures are out with the clinical competence – or confidence - of practitioners and they require advice or support on how to manage the case effectively.

Referrals are sent through a centralised referral system in Scotland known as SCI Gateway, where they are vetted by clinicians in the PDS in Grampian. Depending on the intervention required, or the age of the patient, these referrals are then allocated by locality for treatment in a PDS clinic, referred for a General Anaesthetic or returned to the referring clinician for further information about the patient.

Each patient is managed by their individual needs, with some patients continuing to be registered with the Public Dental service following a referral from a general dental practitioner. However, it is important to highlight that the general expectation is that children will be discharged from the PDS for ongoing preventive and routine care with their GDP, following receiving the appropriate treatment to secure a healthy mouth.

There is currently no “PDS specialist” paediatric dental service available in Grampian, as outlined above in Figure 15. Instead, paediatric patients are triaged by locality and assigned the closest, or most appropriate PDS clinic to them. A PDS clinician will then conduct a full assessment of their dental health needs, as well as evaluate their ability to cooperate with dental treatment (with or without inhalation sedation) –to develop a treatment plan for them.

The Scottish Intercollegiate Guidelines Network (SIGN) recommends that fluoride varnish and the fissure sealant of appropriate teeth should be undertaken in primary care settings for all children at risk of caries. These procedures can take place in both the PDS and GDS, however, further referral to the hospital dental service for patients who are not able to cooperate in these primary care settings.

If a patient is considered “pre-cooperative”, the dental decay present is particularly extensive, or their dental anxiety is so severe that they are unlikely to tolerate treatment, they may also be referred for dental treatment under a general anaesthetic.

Table 2 (below) shows the number of referrals received through DARC (Dental Advice and Referral Centre) into the public dental service in each HSCP between September 2022 and September 2023.

Table 2: Referrals received through DARC into the public dental service from GDS ⁶⁶

HSCP:	Total Referrals Sept 22 – Sept 23	% of total referrals
Aberdeen City	933	39%
Aberdeenshire	1123	47%
Moray	342	14%
Total	2398	100%

The percentage of PDS paediatric referrals received is almost in line with the percentage population of children in each HSCP. Aberdeenshire and Moray make up 48% and 15.5% of the population of children in Grampian respectively and received 47% and 14% of the referrals. Aberdeen City had a slightly higher percentage of referrals (39%) in comparison to only making up 36.5% of the population of children.

Data is not currently available on a specific breakdown of what each referral is for, however, analysis of this information could help inform service planning in the future.

Hospital Dental Service (HDS)

In Scotland, hospital dental services are delivered from 4 major cities, namely Dundee Dental Hospital (DDH), Edinburgh Dental Institute (EDI), Glasgow Dental Hospital (GDH) and Aberdeen Dental Hospital and Institute (ADHI). Dundee, Edinburgh and Glasgow all have consultant-led hospital paediatric dental services, which staff also provide services within the local acute children's hospital, however, Aberdeen has not had a consultant service since 2014⁴⁶.

The hospital dental service accepts patients on referral from medical and dental practitioners. Patients can be either be treated in outpatient clinics or, if needed, as inpatients or as day cases. There are no in-patient beds in dental hospitals, so all in-patient activity happens in general hospitals⁴⁶.

The main remits of the hospital paediatric dental department include; offering advice to GDS and PDS practitioners around the management of paediatric patients, providing specialist paediatric dental services for children who require specialist treatment, a tertiary paediatric dental service for medically compromised patients as well as access to specialist advice through managed clinical networks (MCN's)⁴⁶.

Another important remit of dental hospitals across Scotland, including Aberdeen Dental Hospital and Institute, is to offer teaching and training opportunities to dental and dental care professional undergraduate students. This also includes providing teaching for training grade hospital staff (core trainees and specialist trainee registrars), postgraduate specialists and general dental practitioners⁴⁶.

Many of the children who are referred to the hospital dental service require time to become acclimatised to dental treatment, on account of severe dental anxiety or finding it challenging to cooperate in the GDS or PDS. Because the HDS is also designed to offer teaching opportunities to the clinicians mentioned above, this provides the perfect platform to give these children the additional time and support needed to deliver oral health education and acclimatisation that might not be possible in the PDS or GDS.

SDNAP reports that the main role of a hospital paediatric dental department is to "ensure that children who require multidisciplinary care, particularly children with medical co-morbidities or requiring input from other dental specialities, receive the level of dental care they require through shared care pathways"⁴⁶. As mentioned previously, Grampian currently has no consultant-led hospital dental service, which restricts the facilitation of a multidisciplinary team approach.

The multi-disciplinary team methodology is used for orthodontic, restorative and maxillofacial cases however there is currently no role for specialist paediatric dental input into these processes. This is largely due to a low volume of patients requiring this approach and ongoing staffing issues across all departments.

The dentist with a specialist interest in paediatric dentistry based in Aberdeen Dental Institute predominantly deals with paediatric dental trauma and dental abnormalities cases that are referred in from primary care. While the patient numbers are relatively low for these forms of treatment, the complexity is often very high and outside the scope of a general practitioner. Examples of this are patients with severe Molar Incisor Hypo-mineralisation, hypodontia and management of supernumerary teeth.

Because there is no consultant-led service in Grampian, complex cases often have to be referred to other centres across Scotland. There are no formalised shared care agreements between health

boards for the management of these patients, however, consultant input may be available from Dundee or Glasgow if required. Dundee typically supports amelogenesis imperfecta cases and other dental abnormalities that require long-term management and maintenance, while all patients who have cardiac issues usually are managed in Glasgow.

General Anaesthetic (GA)

In Scotland, general anaesthesia for dental extractions must be provided within a hospital setting⁴⁸. Dental treatment under general anaesthetic is often seen as the last resort intervention for patients who are unable to receive treatment in primary or secondary care. Generally, most NHS patients can receive dental treatment with local anaesthetic however, there is a small proportion of patients for which the prospect of this is overwhelming and additional measures must be taken to facilitate their care.

Patients who fall into this category generally have severe dental anxiety or phobia that prevents them from being able to participate in primary or secondary care settings. There are also a significant number of patients who have a physical or mental condition that requires a comprehensive approach to dental care under general anaesthetic. This can range from patients with a complex medical or dental history, patients with a physical or intellectual disability or patients who have severe dental disease at a young age and are too young to receive the required treatment – who are labelled pre-cooperative.

Because of the risks associated with undergoing a general anaesthetic, there are a number of alternative treatment methods that clinicians will try to use in the first instance. These include; treatment under local anaesthetic, inhalation sedation, hypnosis, behavioural management, oral sedation and IV sedation. Many of these approaches are based on reducing a patient’s anxiety to a manageable level to be able to undertake the required dental treatment, which often requires multiple visits to build the patient’s rapport, confidence and expectations of treatment.

Despite the need for the patient to attend multiple visits when receiving some of these alternative approaches to treatment, like inhalation sedation, figure 16 (below) highlights that the cost of sedation per month, for the same number of referrals, is almost 3x less expensive than carrying out the treatment under GA. Over a year, this equated to nearly a £1 million difference in total spend for the same number of referrals managed, and given these statistics are from 2010 it is likely to be a significantly higher saving in 2023.

Figure 16: Cost of extraction only GA in the hospital setting as calculated by NICE in NICE 2010 ⁴⁶

Time period	Cost of dental GA	Cost of sedation
1 month/4 weeks	Number of referrals received 211 211 x £719.90 = £151,898.90	Number of referrals received 211 211 x £273.01 = £57,605.11
1 year/12 months	Number of referrals received 211 211 x 12 = 2321 2321 x £719.90 = £1,670,887.90	Number of referrals received 211 211 x 12 = 2321 2321 x £273 = £633,656.21

One advantage of providing treatment under general anaesthetic instead of other forms of sedation and behaviour management is the ability to complete all necessary treatment in a single visit. The

patient often has no recollection of this experience and the time available allows extractions and restorative treatment to be carried out on a patient that it might otherwise be impossible to access their mouth to provide treatment. This “one-stop-shop” method also facilitates a multi-disciplinary approach to patient care that may not have been possible if the patient was receiving treatment in primary care.

There are two significant disadvantages to this approach, however. Firstly, the patient has no opportunity to overcome their fears around attending the dentist because they have no recollection of receiving the treatment. This can lead patients to have a reliance on having their dental treatment completed under general anaesthetic, or sedation, instead of facing the root cause of their anxiety.

Another significant issue with the comprehensive approach used during dental treatment under GA is that clinicians often have to be more invasive in their approach to restoring or extracting teeth. Because of the risks associated with GA, it is important to minimise, where possible, the number of GAs a patient receives in their lifetime. If a tooth is identified as having caries, there is a significantly higher chance that it will be extracted instead of restored when having treatment under GA – to reduce the risk of caries developing further, which is likely to require another GA to resolve.

Grampian GA Services

Across Grampian there is a standardised paediatric general anaesthetic pathway, which is sent through SCI gateway and both organised and administered through DARC. A PDS dentist will triage and assess the referrals, determining if they are appropriate for treatment under general anaesthetic.

Currently, all general anaesthetics for children are carried out in the Royal Aberdeen Children’s Hospital (RACH). Work is also underway in Moray to re-establish a paediatric dental GA list at Dr Gray’s Hospital (DGH) in Elgin. Before 2020, DGH was able to accommodate a dental GA list twice monthly, however, following the pandemic this service was suspended amidst ongoing theatre and staffing issues in secondary care settings. Unfortunately, these staffing issues, particularly with theatre staff and anaesthetic trainees, have been omnipresent across the health board which has led to a significant backlog across all GA waiting lists in Grampian.

The Scottish Government sets a target of 95% of new outpatient patients waiting no longer than 12 weeks from referral to being seen. The issues mentioned above around staffing paediatric dental GA lists and the current pressure on primary care services have led to a significant backlog in services, meaning this target is often being missed for these types of procedures in Grampian and across the country.

As of October 2023, there are **444** children on the waiting list for dental treatment under general anaesthetic in Grampian. A child will only go onto the GA waiting list when they have been assessed by the PDS clinician as being appropriate for this form of treatment. This waiting list is separated into 4 categories, depending on the amount of time a child has been waiting for a GA: >12 weeks, >16 weeks, >26 weeks and >52 weeks.

Of these **444** children on the GA waiting list, **301** (67.8%) have been waiting more than 12 weeks and **268** (60.4%) have waited more than 16 weeks to receive their required treatment.

Important to highlight is that **233** (52.5%) of children waiting on the Grampian dental GA list have done so for more than 6 months and **162** (36.5%) have waited for more than a year. Given that many

of these patients will be sent for a GA to manage extensive caries, particularly at an early developmental age, this delay is likely to have a significant impact on other parts of their lives as they wait for their treatment.

Figure 17 (below) highlights the trend of GA patients' waiting times. There has been a significant spike in patients falling outside the Scottish Government treatment targets between 2022 and 2023. The patient numbers across all metrics have been decreasing in recent months due to sustained efforts to improve the utilisation of GA lists and the availability of the theatre dental GA sessions despite the ongoing theatre staffing issues.

Figure 17 – Long waits chart for paediatric dental general anaesthetic ⁶⁷



At current capacity, Grampian can deliver around 2 to 3 lists of patients for exodontia (tooth extraction) under general anaesthetic each week. On top of this, there is also the capacity to provide approximately 2 comprehensive care lists per month for children with additional support needs who can't accept care in surgery or with sedation. These lists are also named Paediatric Special Needs lists and typically include children with severe autism, complex medical needs and very occasionally older children with severe anxiety.

Figure 18: Long wait charts for Paediatric Special Needs GA waiting list in Grampian, 2022-2023 ⁶⁷



Figure 18 (previous page) shows that PSN lists are following a similar trend to the exodontia GA waiting times. The significant increase across all metrics highlights that more children are waiting for long periods to receive their treatment under general anaesthetic in Grampian in 2023. The current PSN waiting list is significantly lower than the routine paediatric list at **44** patients. Of this, **40** (90.9%) of them have been waiting for >12 and >16 weeks.

Seventy-five per cent (**33**) of these children have been waiting over 6 months for treatment while 54.5% (**24**) have been waiting over a year. Because these lists are scheduled for 1 -2 sessions per month there is limited capacity to make a significant impact on reducing these numbers. Given many of these patients have additional support needs, this delay in their treatment is likely to have an impact on their development, particularly if they are experiencing pain.

The Scottish Government has set a new target for reducing the backlog of general anaesthetics, which aims for those who have been waiting longest to get priority. That is currently one of the key drivers for the availability of theatre sessions and theatre staffing capacity.

In some instances, if a patient needs comprehensive dental care and a dental surgical procedure that is out of the scope of the clinician managing the list, a multi-disciplinary approach is taken by contacting the Maxillo-facial department for input. This is done on a case-by-case basis, through the clinical lead for maxillo-facial surgery, who assess the case and can send someone to join the dental list on the day if staff are available.

Clinicians in maxillo-facial surgery also provide dedicated lists for paediatric patients, delivering treatments including managing supernumerary teeth and exposing maxillary canines. This patient base largely does not fall under the scope of this needs assessment as the children are generally older than 12 when they receive this treatment.

Childsmile and Oral Health Improvement

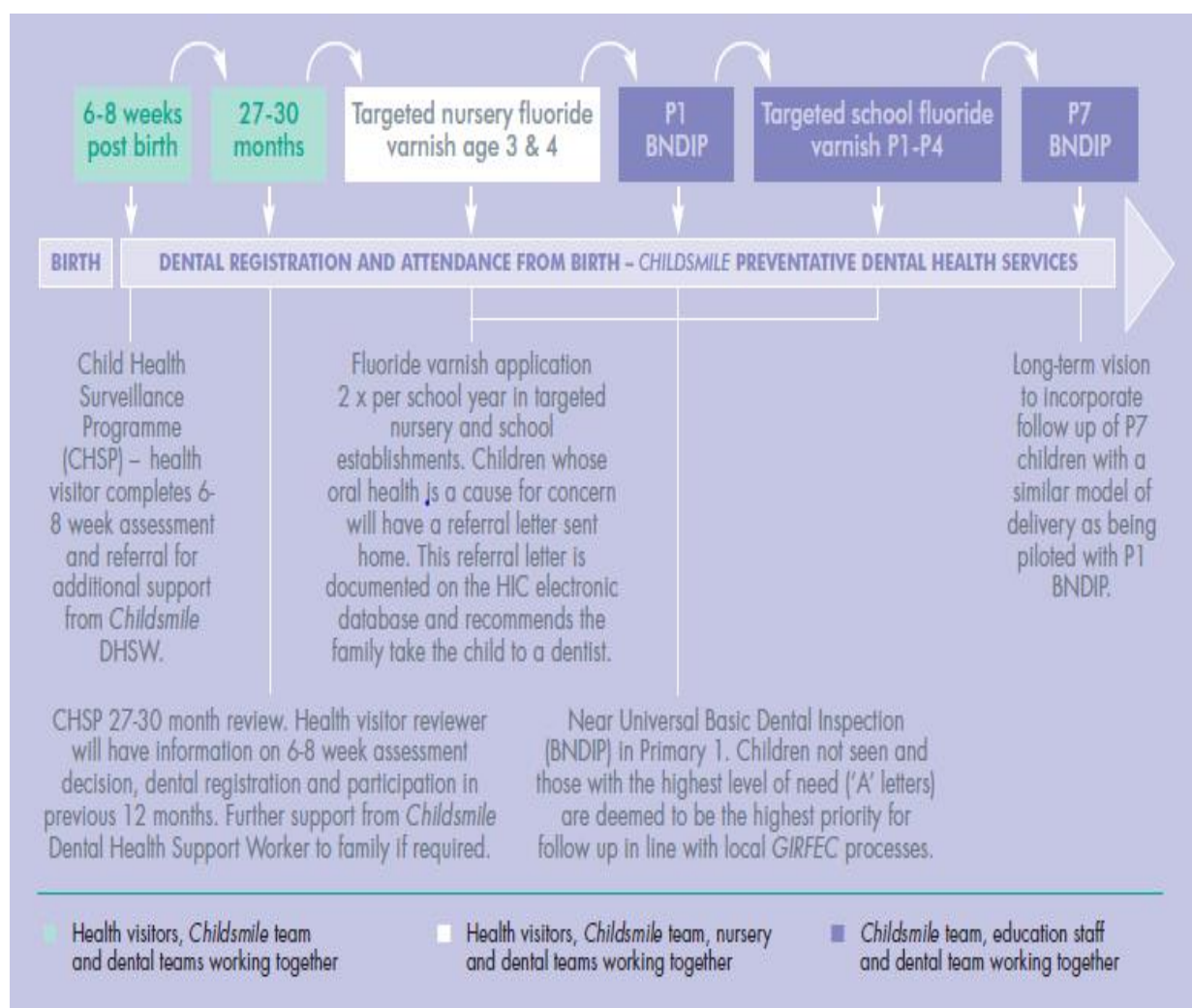
Childsmile is a national programme designed to improve the oral health of children in Scotland and reduce inequalities in both dental health and access to dental services⁵⁰. It uses a combination of targeted and universal approaches to tackling children’s oral health improvement through the four programme components – (Core Programme, Childsmile Practice, Childsmile School and Nursery).

At a population level, Childsmile delivers free daily supervised tooth brushing in nurseries, free dental packs to support toothbrushing at home and a tailored programme of care delivered through primary care dental services.

Childsmile also takes a targeted approach to improving children’s oral health through; additional home support and community interventions, an enhanced programme of care within primary care dental services, clinical preventive programmes in priority nurseries and primary schools and a daily supervised tooth brushing programme.

Figure 19 below summarises the Childsmile oral health and NDIP pathway, illustrating the importance of inter-sectoral working from the Childsmile team, health visitors, education staff and dental teams to deliver multiple interventions throughout the patient’s different ages and life stages.

Figure 19: Childsmile/National Dental Inspection Programme (NDIP) Dental Health Surveillance Pathway⁵⁰



Supervised Toothbrushing Programme

The Childsmile Toothbrushing programme is offered to:

- Two-year-old children receive free places at nursery,
- Every three and four-year-old child attending nursery,
- At least 20% of the P1 and P2 classes who live in areas with the highest level of need.

All elements of the supervised toothbrushing programme adhere to national standards and products are provided through a national contract to ensure consistency of care is delivered across health boards⁵⁰.

Every child in the programme receives a dental pack on at least six occasions by five years of age. These dental packs contain a toothbrush, a tube of toothpaste (at least 1000ppm fluoride) and information on key oral health advice and preventative messages⁵⁰.

The programme aims to embed toothbrushing with children at an early age and to develop this essential life skill as part of their daily routine. By ensuring that children at least receive one application of 1000ppm fluoride toothpaste at home, as well as in nursery and school, they can significantly reduce their risk of developing dental caries.

The national target for the Childsmile programme is for 100% of nurseries and at least 20% of P1 and P2 classes to be engaged with supervised toothbrushing, particularly those situated in areas of high deprivation within Grampian.

NHS Grampian – Childsmile Core

According to the headline Childsmile report in 2022/23, there were 326 preschool or nursery establishments and 239 local authority primary schools in Grampian. Of this, **83.4%** of pre-schools/nurseries (**272**) and **28.9%** of primary schools (**69**) were participating in the Childsmile supervised tooth brushing programme – also known as Childsmile Core. This is a significant improvement from the previous year, where only **55%** of nurseries (**182**) and **21.3%** of primary schools (**51**) were involved in the supervised toothbrushing programme.

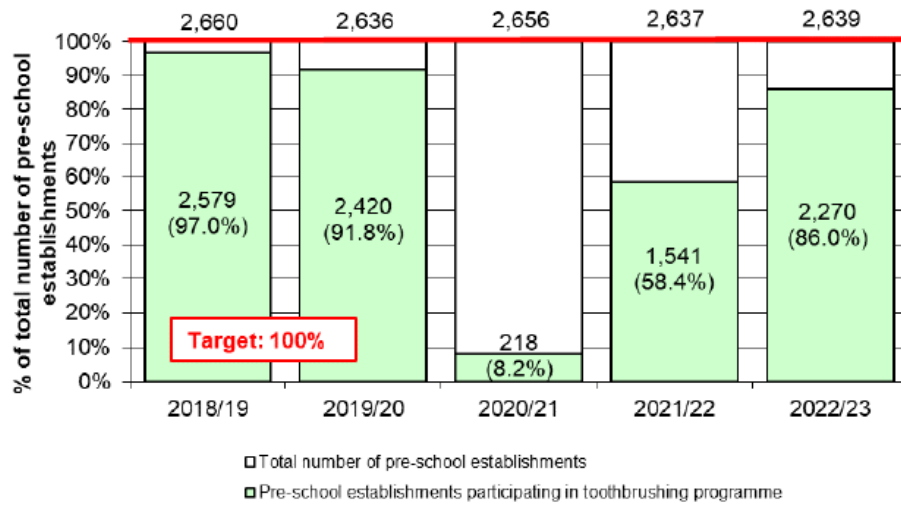
Nurseries

Figure 20 (next page) shows that in 2023, the Scottish average for nurseries participating in Childsmile Core was **86%**, which is slightly above the participation rate in Grampian (**83.4%**)⁵³. Figure 20 also highlights the impact of COVID-19 on the supervised toothbrushing programme and the continued process of recovery back to pre-2019 levels of engagement. Several boards have faced challenges recovering engagement with pre-schools and nurseries back to pre-pandemic levels, however, it is important to note that only NHS GGC (58%) and NHS Dumfries and Galloway (68.3%) have lower participation rates than Grampian. This reinforces the need to work closely in partnership with stakeholders in education to continue to improve the levels of engagement with establishments, to reach the 100% target in the future.

Health Informatics Centre (HIC) data highlights that in 2022/23, a total of **269** nurseries and playgroups participated in the national toothbrushing programme in Grampian⁵³. **89** of these were in Aberdeen City, **142** in Aberdeenshire and **38** in Moray^a. This is an improvement from 2021/22 where **166** nurseries participated, **73** in Aberdeen City, **93** in Aberdeenshire and **1** in Moray⁵³.

^a Note discrepancy between HIC data and Childsmile Headline Report on the number of participating establishments

Figure 20: Nurseries participating in toothbrushing programme in Scotland academic year 2018/19 – 2022/23⁵²

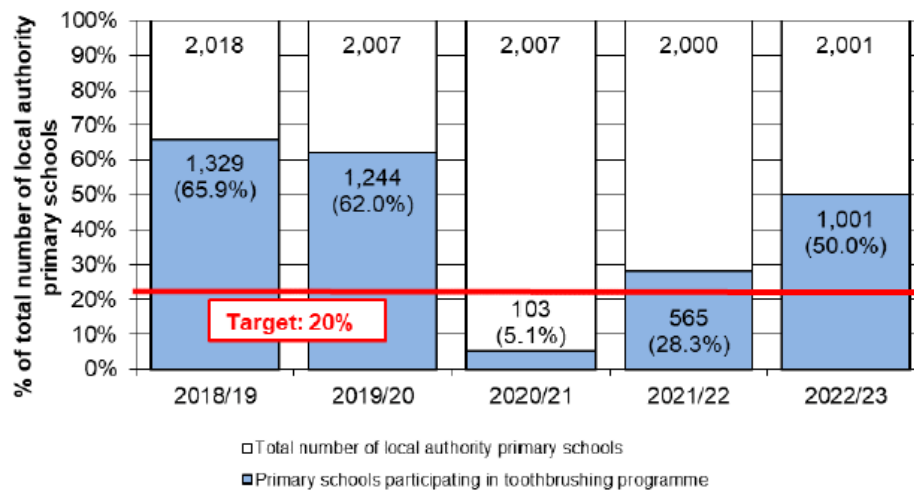


Primary Schools

The Childsmile headline report⁵² in 2022/23 indicated that a total of **69** primary schools in Grampian (**28.9%**) participated in Childsmile Core, which is below the national average of **50%**. NHS Tayside is currently the only board to have a lower level of primary schools participating in the programme, at 20.8%. However, the figure in Grampian has increased from **51** in 2021/22, demonstrating that progress continues to be made in returning engagement to the same level as before the pandemic.

Figure 21 (below) further reinforces the impact of the COVID-19 restrictions on the programme across the country and the ongoing process of recovery back to pre-pandemic levels.

Figure 21: Primary schools participating in tooth brushing programme in Scotland academic year, 2018/19 – 2022/23⁵²



According to HIC, in 2022/23, a total of **71** primary schools participated in the programme, **28** of which were in Aberdeen City, **36** in Aberdeenshire and **7** in Moray. In 2021/22, only **17** primary schools participated in Aberdeen City, **31** in Aberdeenshire and **1** in Moray, highlighting the continued efforts of the Childsmile teams in each HSCP to return services to their pre-pandemic levels⁵⁴.

A challenge remains to recover the number of primary schools engaging in Moray, where in 2019/20 19 schools were participating in the supervised toothbrushing programme. Aberdeen City and Aberdeenshire have a small group of schools that the Childsmile team face additional barriers to ensuring consistent participation in the toothbrushing programme, however, both have almost fully recovered to the number of schools they achieved in 2019/20 ⁵⁴.

Fluoride Varnish Applications (FVA's)

The Childsmile fluoride varnish programme is a targeted intervention aimed at improving the oral health of children in areas of high socio-economic deprivation⁵⁰.

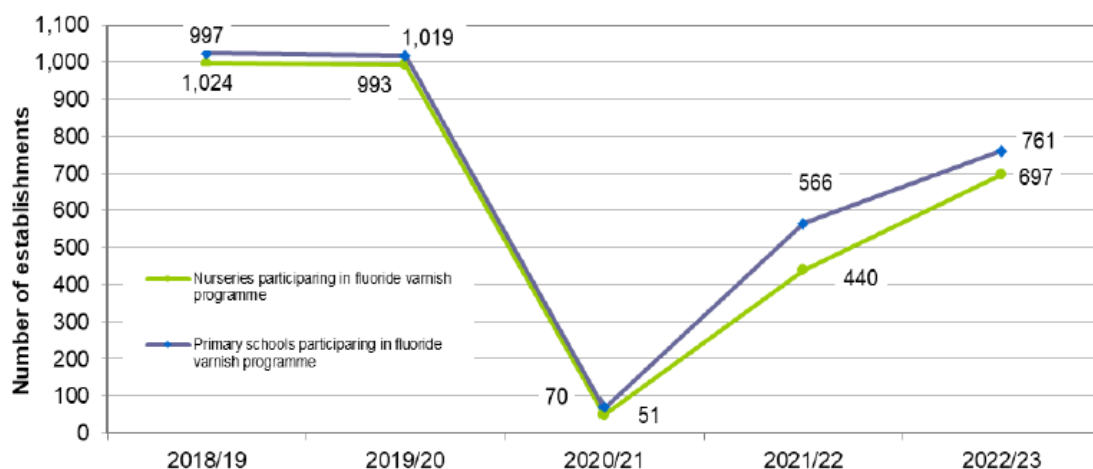
Childsmile teams, usually comprised of an extended duties dental nurse (EDDN) and a dental health support worker (DHSW), attend education establishments (nurseries and primary schools) to deliver twice yearly fluoride varnish applications – alongside oral health education⁵⁰.

Establishments are selected to participate in the programme based on the proportion of children attending who live in areas of relative disadvantage, which are calculated through data from the Scottish Index of Multiple Deprivation, the National Dental Inspection Programme and the free school meal programme.

Children requiring further dental assessment or who would benefit from advice from a dentist are identified through this process and their parents receive a letter, or direct contact, to inform them of the identified dental need.

The number of fluoride varnish applications delivered across Scotland was impacted significantly between 2019/20 and 2020/21. During this period, the number of nurseries and schools participating in fluoride varnish applications dropped from a total of 2012 down to just 121, as shown in Figure 22 (below)⁵². It is encouraging to highlight that the number of nurseries and schools participating in the fluoride varnish programme across Scotland has dramatically increased again in 2022/23, as shown below.

Figure 22: Nurseries and primary schools participating in fluoride varnish programme in Scotland, 2018/19 – 2022/23 ⁵²



Nurseries

In 2021/22, **31** nurseries were targeted for fluoride varnish application visits in Grampian, which is 9.4% of the total preschool establishments in the health board. This target was exceeded, as **35** nurseries/pre-schools had participated in fluoride varnish application visits by the end of the academic year⁵⁶. A total of **57.6%** of the nurseries targeted were in SIMD 1 areas and **30.3%** in SIMD 2 areas, reflecting the targeted approach used in the fluoride varnish programme⁵⁶.

In 2022/23, the number of nurseries actively participating in the fluoride varnish programme had risen to **51**. Because this program targets children who live in the most deprived areas, **64.7%** of the nurseries were based in SIMD 1 areas and **21.6%** in SIMD 2 areas⁵².

There has been an increase in the number of nurseries in SIMD 1 and 2 areas engaging between 2021/22 and 2022/23⁵². The number in Moray in particular has risen from only 3 nurseries in the most deprived areas in 2021/22 to **15** nurseries in 2022/23⁵⁵. Aberdeen City has seen a small increase from **13** to **16** in the same period and Aberdeenshire has remained consistent at **13** nurseries in SIMD 1 and 2 areas while seeing marginal increase in the number of SIMD 3 and 4 areas from **2** to **4**⁵⁵.

Primary Schools

In 2021/22, **40** primary schools were targeted for fluoride varnish applications in Grampian, which is **16.7%** of the 239 local authority primary schools in the area. This target was also reached and exceeded, with **46** primary schools participating in fluoride varnish application by the end of the academic year⁵¹.

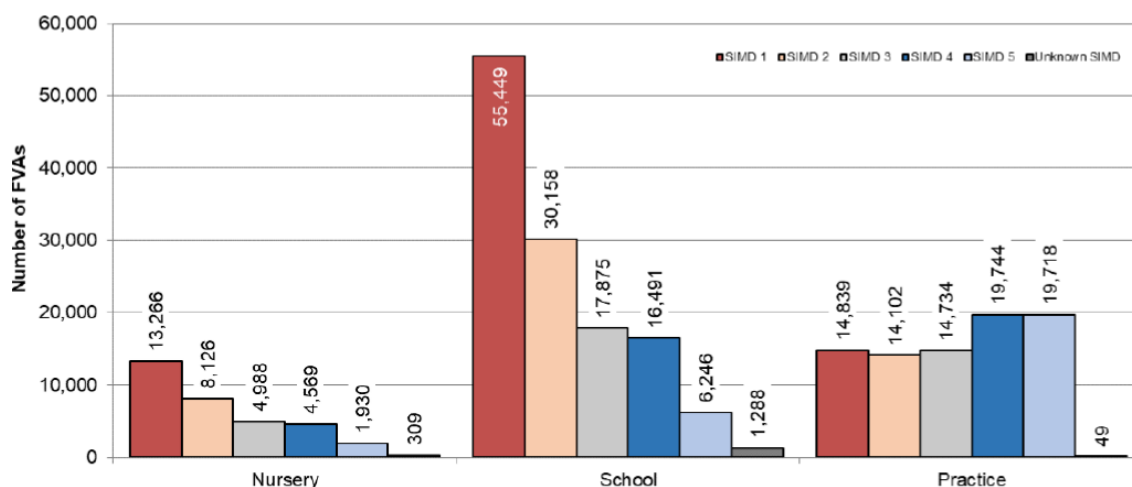
For 2022/23, the number of primary schools participating in fluoride varnish applications has decreased slightly to **44**. In SIMD 1 areas, **23** schools engaged with the fluoride varnish programme, **13** schools in SIMD 2 areas and **6** in SIMD 3 areas⁵⁵.

In contrast, before the onset of the pandemic in 2019/20, a total of **111** primary schools received fluoride varnish application visits in Grampian, which is nearly 2.5x the current number⁵². Of the **111** schools in Grampian, **28** were in SIMD 1 areas, which is similar to 2022/23, however, **52** schools engaged with the programme in a SIMD 2 area and **22** schools in a SIMD 3 area⁵⁵.

Figure 23 (below) shows the distribution of fluoride varnish applications over 3 settings: nursery, school and dental practice. In dental practice settings, there is a positive correlation between the affluence of an area and the number of fluoride varnish applications, with the SIMD 1 communities receiving the lowest number of FVAs and SIMD 5 areas receiving the highest.

In contrast to this, the targeted nature of the fluoride varnish programme is illustrated by the distribution of FVAs in schools, which is significantly higher in the areas of increased deprivation – particularly SIMD 1. This approach is designed to reduce oral health inequalities by providing additional support and preventive interventions to areas with the greatest level of need.

Figure 23: SIMD distribution of FVA's in nursery, school and practice settings – Scotland, 2022/23 ⁵¹



Dental Practice

Another key element of the Childsmile programme is delivered through engagement with a local dental practice. In line with the Scottish Dental Clinical Effectiveness Programme (SDCEP) guidance, NHS dental practices are expected to provide fluoride varnish applications to the teeth of all children at 6 monthly intervals from the age of two years.

Other key components of Childsmile in dental practice are; registration from birth, children from 6 months of age attending a dental appointment in practice, delivery of tailored oral health promotion and clinical interventions and a regular oral examination with a dentist⁵⁰.

The formal interventions delivered in dental practices include; dietary advice – to foster good oral health behaviours and prevent decay – toothbrushing instruction and demonstration, fluoride advice and fluoride varnish application⁵⁰.

All dental practice staff are encouraged to promote preventive care, however, many practices tailor their model for delivering Childsmile depending on the staff they have available and the number of children they typically register and treat. In some practices the dentists provide all the interventions, however, others use a combination of a dentist, hygienist, extended duties dental nurse (EDDN) and dental nurses. Some of these Dental Care Professionals (DCPs) will provide one-off episodes of care or preventive advice for patients, however, others, such as EDDN will continue to see the children and parents over a long-term basis, depending on the needs of the family.

Toothbrushing instruction and dietary advice

Although dentists and dental care professionals deliver toothbrushing instruction and dietary advice at various stages throughout a patient's life, the data around the number of children aged 0-2 and 3-5 is closely monitored as an indicator for the Childsmile programme.

Figure 24: Proportion of 0-2 children registered with an NHS dentist receiving toothbrushing instruction and dietary advice – Scotland, 2017/18 – 2021/22 financial year⁵¹.

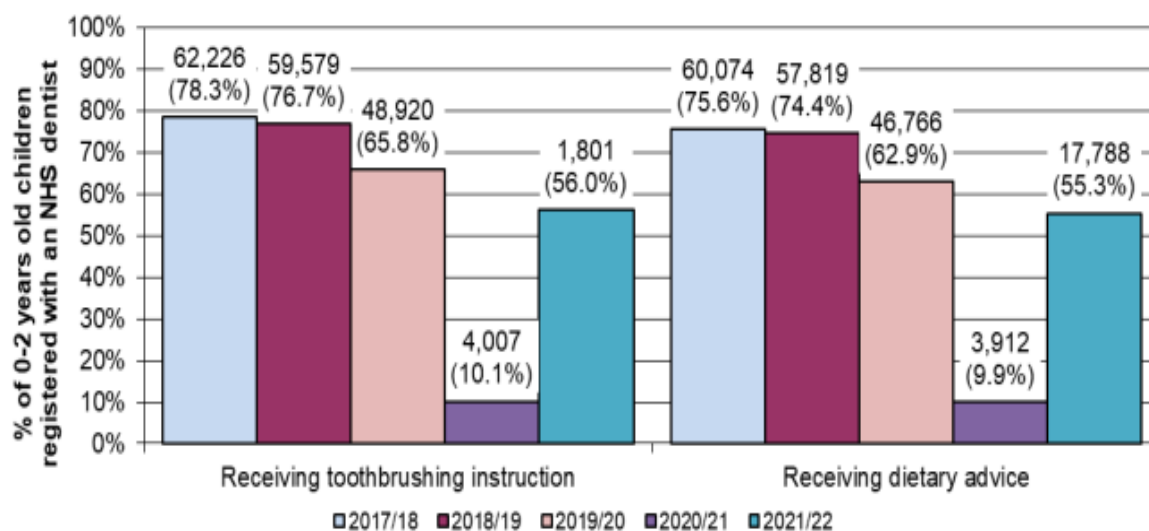


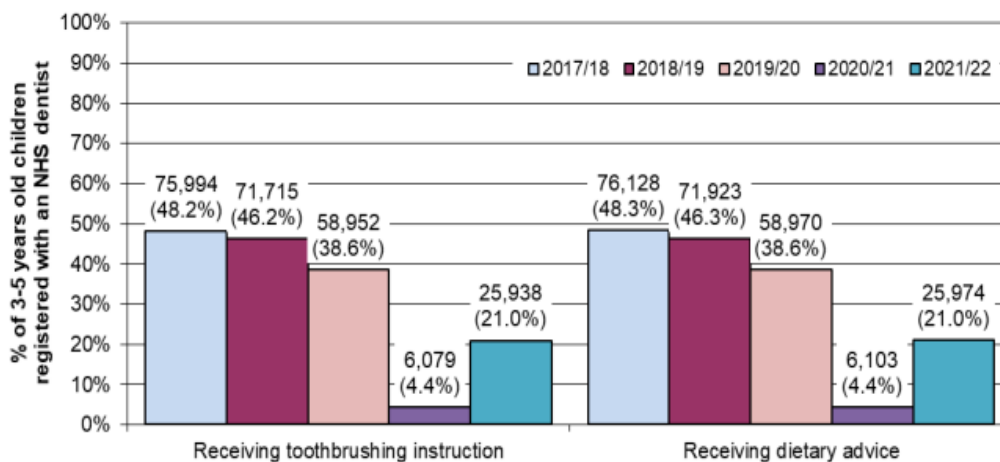
Figure 24 (above) illustrates the downward trend in the number of 0-2-year-old children receiving toothbrushing instruction and dietary advice across the country. Even accounting for the significant drop in provision due to the pandemic, the number of 0-2-year-olds registered that receive this preventative care is down over 20% from the levels achieved in 2017/18. Consideration must also be given to the fact that the registration rate amongst 0-2-year-olds has also dropped significantly following the pandemic, so the total number of claims for toothbrushing instruction and diet advice has been dramatically impacted. While 56% of children registered in this age group received toothbrushing instruction in 2021/22, this was only delivered to 18,013 patients - which is down from 62,226 children in 2017/18.

In 2022/23, there were 5,011 children aged 0-2 registered with an NHS dentist in Grampian. A total of 79.7% of these (3,993) received toothbrushing and diet advice from their general dental practitioner.

Children in the 3-5-year-old age group have followed a similar trend, dropping from a high of around 48% for both toothbrushing instruction and diet advice in 2017/18 down to just 21% of registered patients receiving this care. The drop in patient registrations in this group has not been as severe as in the 0-2 cohort, however, the level of provision is close to a third of what it was in 2017/18. Figure 25 (next page) illustrates that while the percentage of children receiving these interventions has increased significantly following the pandemic restrictions, there is still significant work required to return these to the levels in 2017/18. Aside from the obvious drop as a result of the pandemic, there was already a downward trend in the provision of these preventative interventions. Further investigation is warranted to understand why general dental practitioners were providing less of these essential preventative interventions to young patients to understand how we can improve this moving forward.

In 2022/23, the Childsmile headline report identified that 13,177 children aged 3-5 were registered with an NHS dentist, with 6,764 (51.3%) receiving toothbrushing instruction and diet advice from their general dental practitioner.

Figure 25: Proportion of 3-5-year-old children registered with an NHS dentist receiving toothbrushing instruction and dietary advice – Scotland, 2017/18 – 2021/22 financial year⁵¹.



Community Engagement

Health visitors play an important role in the Childsmile programme as they engage with families and young children at several stages from birth until the child attends nursery. Because health visitors establish this rapport and engagement with families, they are tasked with making the initial decision around what families can be directed straight into dental practice and who will require to be seen by a Dental Health Support Worker (DHSW).

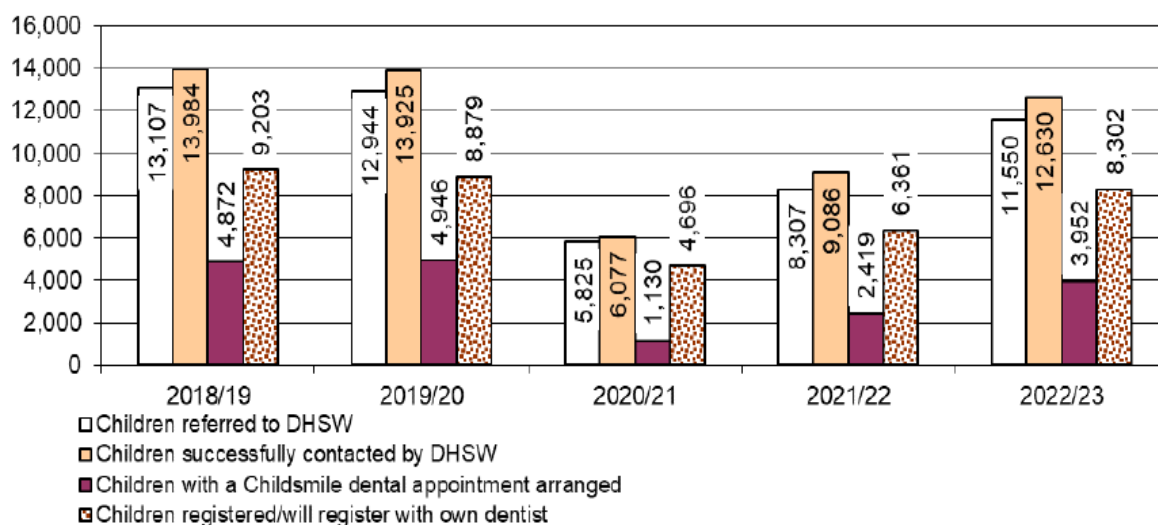
Dental Health Support Workers' primary role is to facilitate families to participate in the Childsmile programme through attendance at a dental practice. The aim of this is to link the child with a dental practice as early as possible for them to become accustomed to visiting the dentist at an early age.

DHSWs are encouraged to explain the benefits of the Childsmile programme, explain the reasons for registering and attending the dentist as well as what to expect during appointments. The primary focus is linking the family and child into dental practice, but this can include ensuring the family knows how to get to the practice as well as linking them to other local activities in their community that support good oral health (e.g. weaning groups or cookery classes).

Home support can also be provided by the DHSW as a short-term measure, however, if the parent cannot be persuaded to attend the dental practice the DHSW can continue visiting the family. These visits are an opportunity to discuss important oral health messages as well as promote the benefits of regular dental attendance to the family. If a child fails to attend a practice on two occasions, the practice is advised to contact the DHSW, who will decide the best course of action in collaboration with the health visitor.

Figure 26 (next page) shows nationally in 2021/22; the number of children referred to a DHSW, the number of children/families contacted by a DHSW, the number of children who had a Childsmile dental appointment arranged through a DHSW and the number of children whose parents/carers indicated that their child was already registered (or planned to register) with their dentist.

Figure 26: Child referral and dental health support worker contact in Scotland, 2018/19 – 2022/23 ⁵³



The number of children contacted through DHSWs and engaging with dental practices between 2018/2019 to 2019/20 was consistent across all metrics. The results in 2021/22 indicate that these numbers are starting to recover again, which is important to celebrate following the significant reduction as a result of the pandemic in 2020/21.

In Grampian, 339 children were successfully contacted by a DHSW in 2021/22, following 325 referrals. This resulted in 77 children having a dental appointment organised through Childsmile, while 235 children self-reported that they were already registered or planned to register in the near future⁵⁷.

In 2022/23 a total of 452 children were referred to DHSWs in Grampian, which is significantly up on the previous year (325)⁵⁸. The vast majority of these referrals (408) came through health visitors, reinforcing the importance of the role that health visitors play in identifying children who would benefit from the Childsmile programme.

Additional Support Needs (ASN)

In 2022/23, there are 15 additional support needs (ASN) establishments actively participating in the supervised toothbrushing element of Childsmile in Grampian. HIC reports that 5 of these establishments are based in Aberdeen City, 10 are based in Aberdeenshire and there are currently no ASN schools participating in the supervised brushing programme in Moray⁵³.

A total of 269 children attend ASN establishments, 53.9% of which received at least one fluoride varnish application (145) and 22.7% received two or more fluoride varnish applications (84)⁵⁵.

There are currently 3 ASN establishments participating in the fluoride varnish programme in Aberdeen City, 8 in Aberdeenshire and no ASN schools are participating in Moray. The pupils attending ASN schools or ASN units in Moray are sometimes combined with the fluoride varnish applications in the adjacent mainstream school, which can often impact the accuracy of the number of ASN pupils reported to have received an FVA.

Dental Workforce Demographics – GDS/HDS/PDS/Childsmile

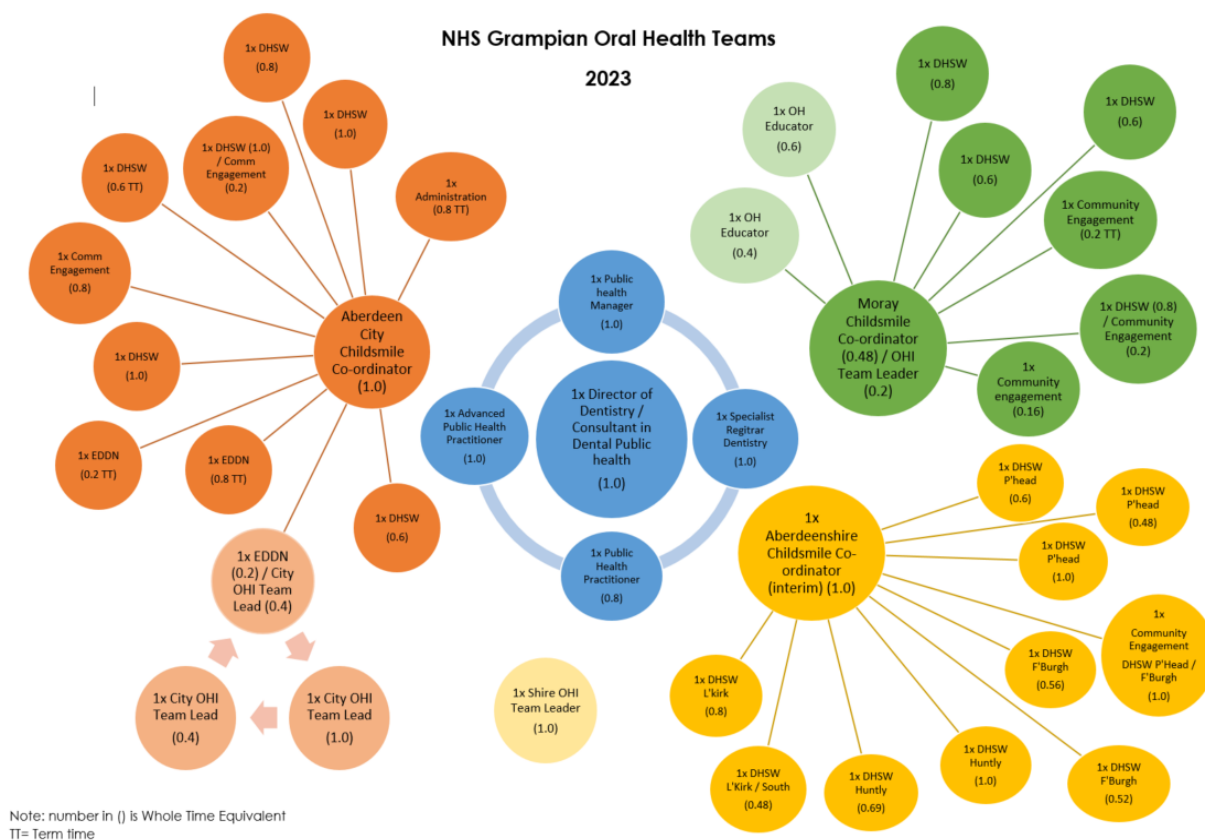
As of December 2022, 349 dentists were working in NHS Grampian (PHS statistics 22 ref). The majority of these clinicians, 272, work as non-salaried GDS dentists, comprised of a mixture of associates, dental assistants and vocational dental practitioners. The Hospital Dental Service employs 27 dentists while a further 55 work in the Public Dental Service (PDS) across the 3 Health and Social Care Partnerships (HSCPs).

The hospital dental service is based in Aberdeen Dental Institute (ADI) and employs 3 general dental practitioners to work one session per week to supervise students. A clinician from the PDS is seconded for 2 sessions per week to carry out treatments and supervise students, as well as a clinical lecturer at the University of Aberdeen with a specialist interest in paediatric dentistry, who also carries out 2 clinical sessions per week. As the hospital dental service also serves to provide students with opportunities to develop their skills, there are 5 students in the clinic 4 days per week, who are each able to treat 2 patients. This gives a capacity of 40 patients per week that can be treated through the student clinic, under the supervision of experienced tutors.

There is also a dedicated dental public health team in NHS Grampian, comprised of 1x public health practitioner, 1x advanced public health practitioner, 1x dental public health manager, 1x speciality trainee registrar and a consultant in dental public health.

The make-up of the Childsmile team and wider Grampian oral health team is below in Figure 27:

Figure 27: Organogram of NHS Grampian’s Oral Health Teams + Childsmile Teams and WTE



Registration and Participation in NHS Dental Services

Registration

Registration is defined by Public Health Scotland as “any patient registered with a practising NHS dentist”⁵⁹. It is important to note that in April 2010, “lifetime registration” was introduced, meaning that if a patient registered with a dentist after this time, their registration would stay with this dentist until they actively removed themselves from the list - either by registering with another dental practice or being de-registered.

In 2019, child registration rates were above 90% in every NHS Board, however by 2022, due to the impact of COVID-19 restrictions, this had dropped to just one NHS Board in the country⁵⁹.

Figure 28 illustrates the trend in registrations of all children in Scotland in both the GDS and PDS from 2000 – 2022, highlighting that there have been significant improvements in the number of children registered with an NHS dentist during this period. While the percentage of children registered dropped after 2019, it is encouraging to note that there has been a small reversal of this trend between 2021 and 2022. In September 2022, 62,993 children aged 0-12 in Grampian were registered with an NHS dentist⁶⁰.

Figure 28 - Percentage of children registered with an NHS dentist in Scotland; by dental service⁶⁰

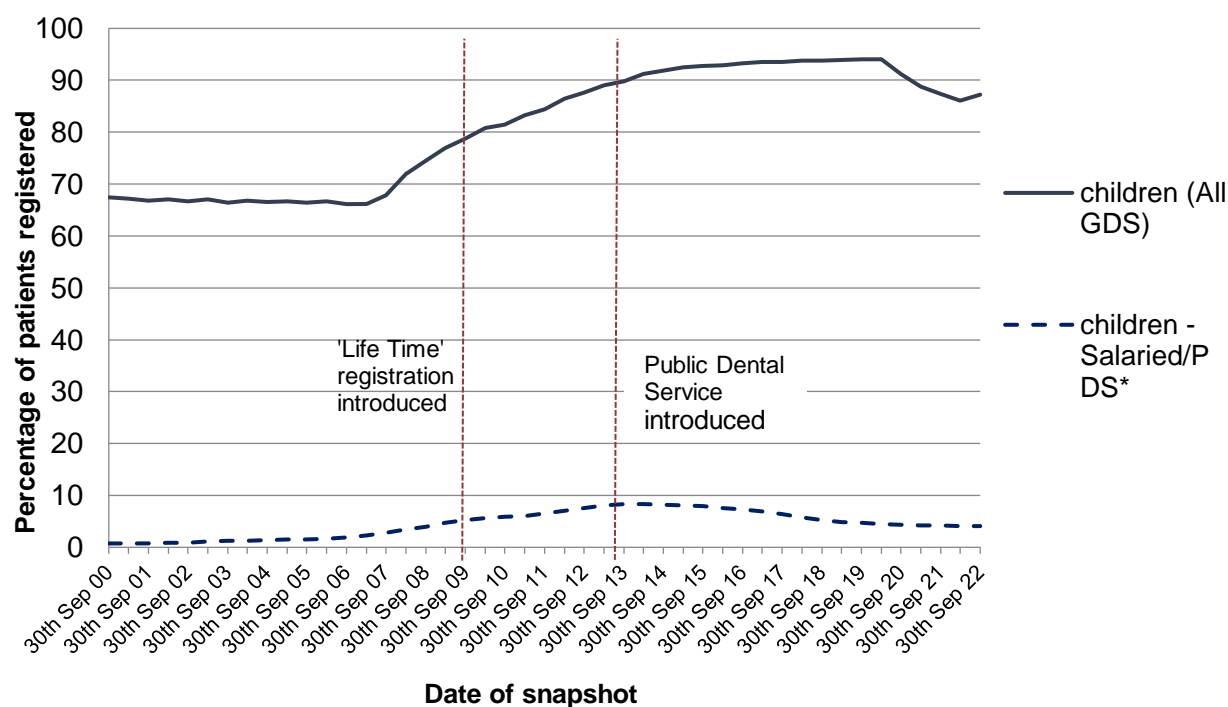
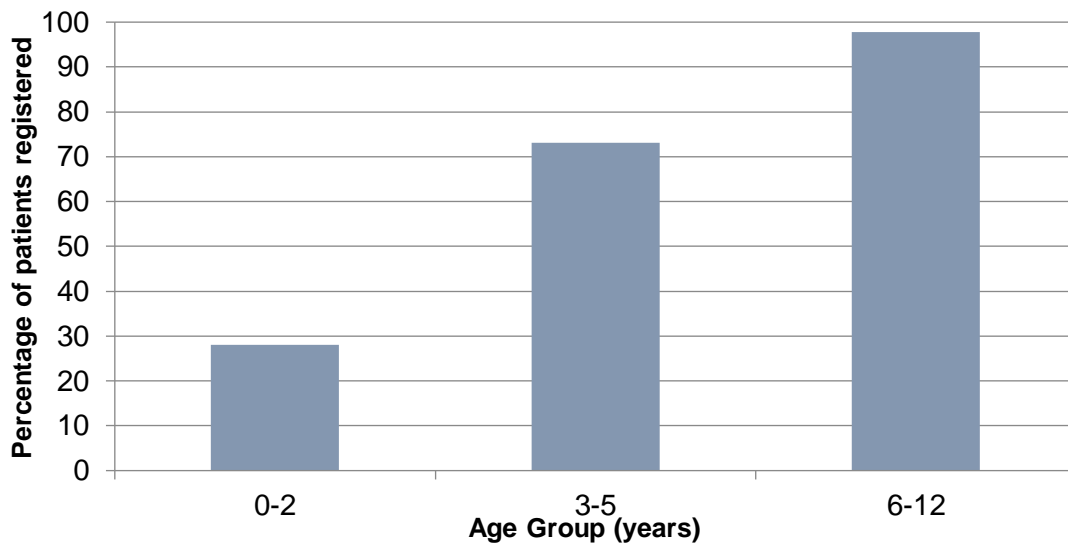


Figure 29 (next page) breaks down the registration figures across the country, in 2022, into distinct age categories. It is positive to see that registration rates in the 6-12-year-old category are high, at 97.8%, while the 3-5-year-old category is slightly lower at 73.1%. The significant outlier in this data is that only 28.1% of children aged 0-2 in Scotland are registered with an NHS dentist in 2022, which is down from 46.9% in 2018. More work needs to be done to understand the reasons behind this sharp decline for this age group and identify solutions to improve the level of registrations to higher than pre-pandemic levels⁶⁰.

Figure 29: Percentage of the population registered with an NHS dentist in Scotland in 2022; by age group ⁶⁰



From a Grampian perspective the registration rates in the 0-2 age bracket in Aberdeen City and Moray, are below the national average at 22.9% and 25.6% respectively, with Aberdeenshire only marginally higher at 30.8%.

For ages 3-5 years, 68.1% of children are registered in Aberdeen City, 72.5% in Moray and 76.7% in Aberdeenshire. These numbers improve significantly in the age group 6-12 years, with 97.1% of children registered in Aberdeen City, 97.4%, 97.8% in Moray and 97.4% in Aberdeenshire⁶⁰.

In Moray, this high registration rate is encouraging because it is at odds with the general trend for the population as a whole when accounting for all age groups. Only 74.6% of the population are registered with an NHS dentist in this area, which is one of the lowest rates across the country, so it is positive to see this 6-12 age cohort engaging with NHS dental services in this way.

Figure 30 – Percentage of all children (0-16) registered with an NHS dentist 2019 – 2022 ⁶⁰

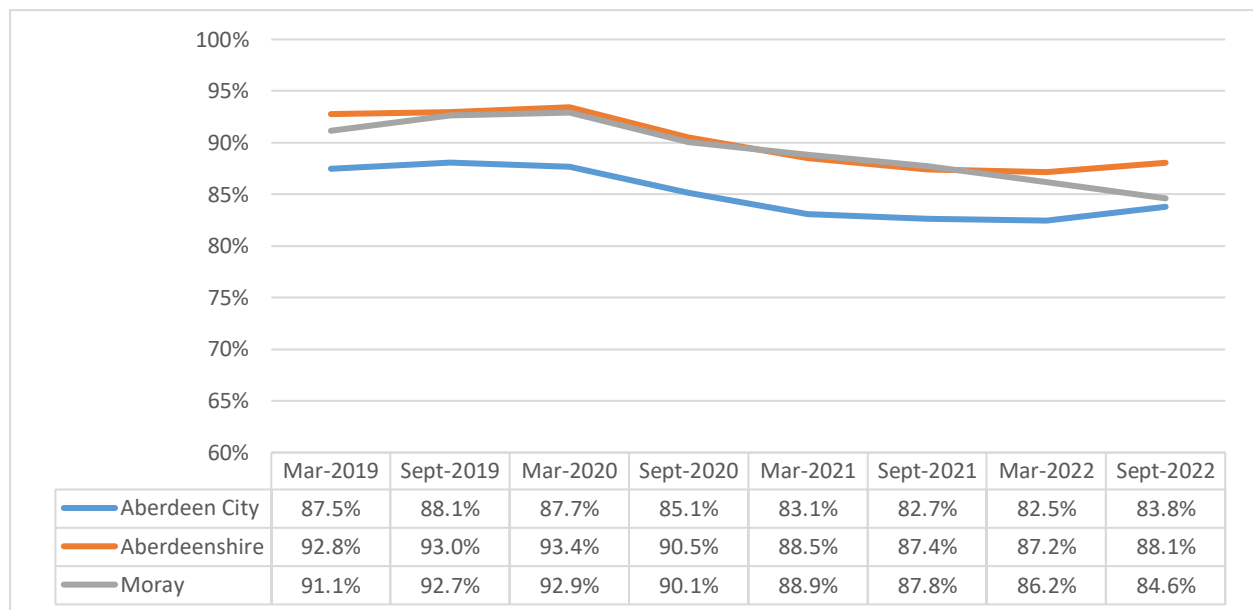


Figure 30 (previous page) illustrates the decreasing trend of registration for children in all 3 HSCPs following the Covid 19 pandemic. Aberdeen City and Aberdeenshire have generally followed a similar pattern to each other, dropping to their lowest registration rates in March 2022 before starting to reverse this trend in September 2022, with an increase in registrations. Moray initially followed this same trend, however, has not been able to improve the registration rates from March to September 2022, dropping from 86.2% to 84.6%. This figure is down from 92.7% before the pandemic⁶⁰. Ongoing challenges with recruitment and retention across the dental sector have had a significant impact on access to dental services for the population, which is likely to be impacting these registration rates.

Registration and SIMD

Registration rates in Grampian for children across all SIMD quintiles remain lower than the Scottish average. Registration rates are higher in more affluent areas (SIMD 3, 4, 5), which is in line with the national trend. Not only are the registration rates lower in SIMD 1 and 2 areas in Grampian, at 83.5% and 82.7% respectively, but the difference from the national average is also the greatest in these areas - reinforcing the prevalence of oral health inequalities in areas with increased deprivation⁶⁰.

Figure 31 – the percentage of children registered with an NHS dentist in Scotland and NHS Grampian, by SIMD, 2019 – 2022 ⁶¹

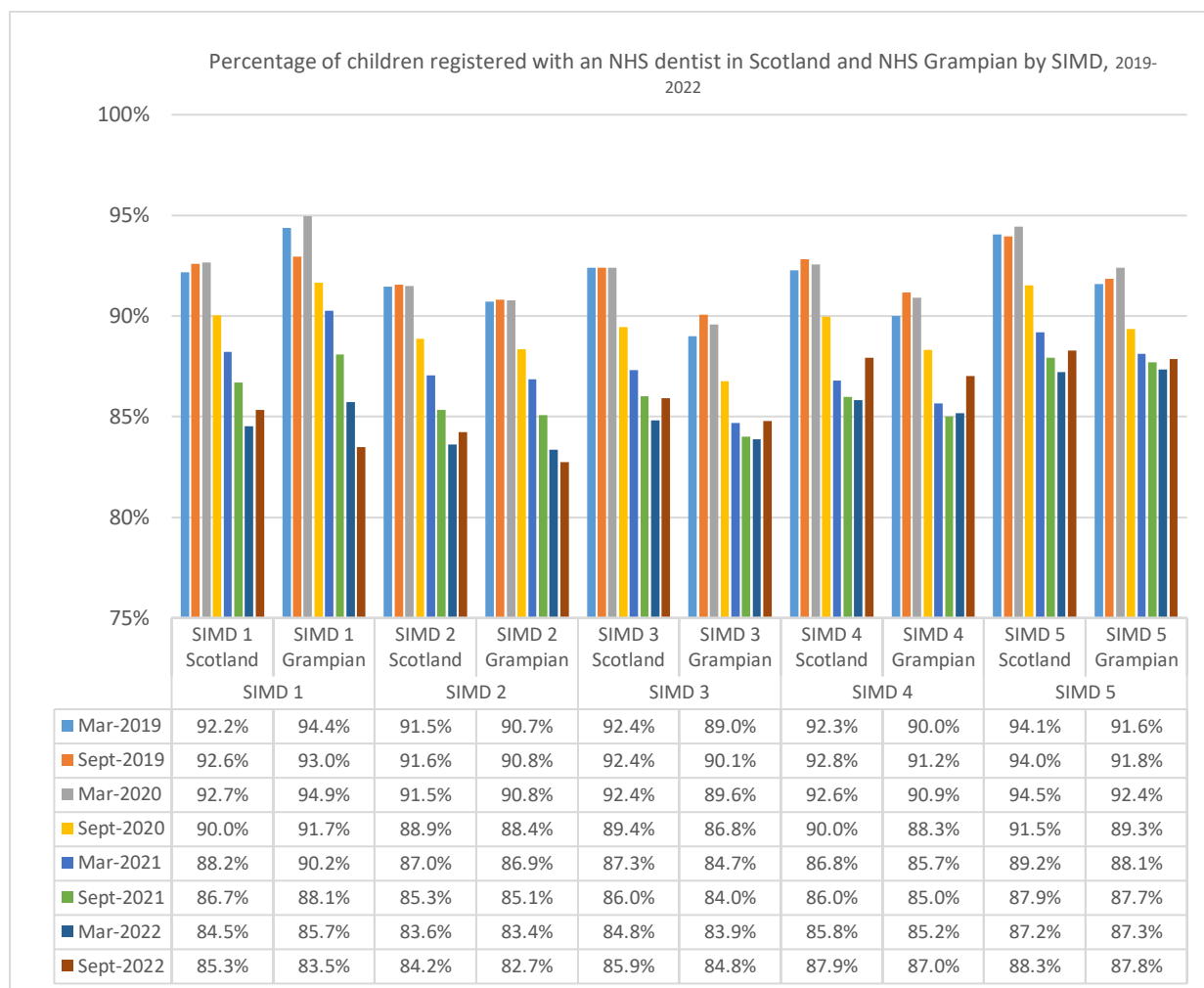


Figure 31 (previous page) illustrates that registration rates in the most deprived communities across Grampian have been adversely affected by the Covid 19 pandemic. Children registered in SIMD 1 areas have fallen from 94.9% in March 2020 to 83.5% in September 2022, a drop of 11.4%, representing the highest drop off in registrations across any SIMD area in Grampian - or about the Scottish average. This significant drop off in registration rates supports the idea access to NHS dental services has worsened as a result of the COVID-19 pandemic, particularly in the most deprived communities - and remains an area for significant improvement going forward.

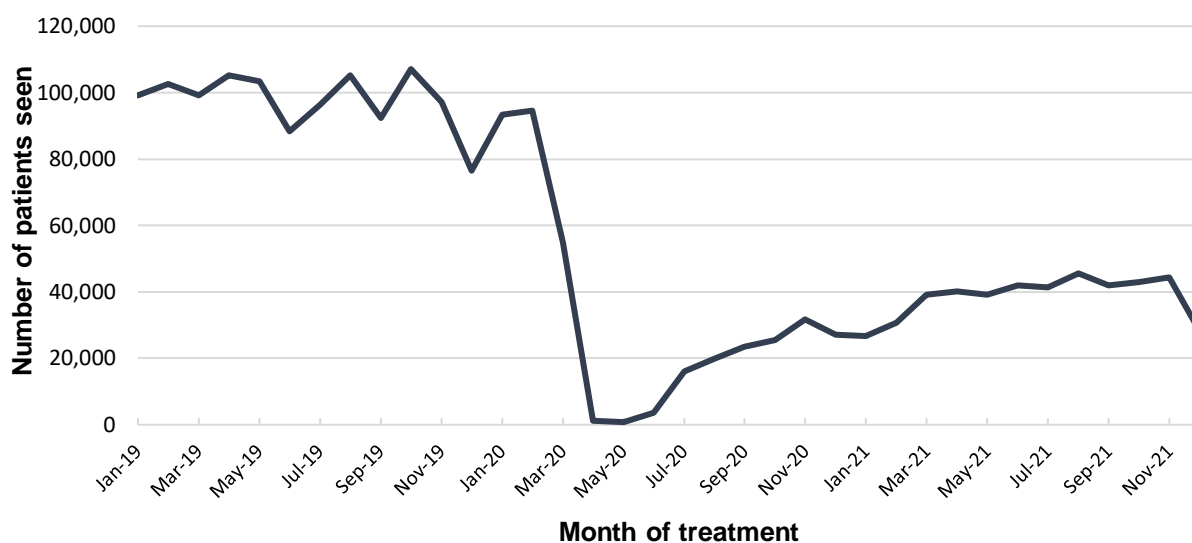
Participation of Registered Patients in NHS Dental Services

Participation is defined by Public Health Scotland as “any patient registered with an NHS dentist who had contact with GDS for examination or treatment in the two years” before the data collection⁵⁹.

Figure 32 (below) illustrates the significant impact that Covid-19 had on participation in dental services across Scotland. The subsequent restrictions imposed on aerosol-generating procedures saw general dental services stop entirely in May 2020 for nearly 3 months.

There has been a gradual process to return this activity level to the same pre-Covid levels however this has been hampered by ongoing recruitment and retention issues with staff across the dental sector, significantly affecting general dentists’ abilities to provide the same volume of treatment.

Figure 32: Number of children seen by an NHS dentist in Scotland; by month and year of treatment ⁶⁰



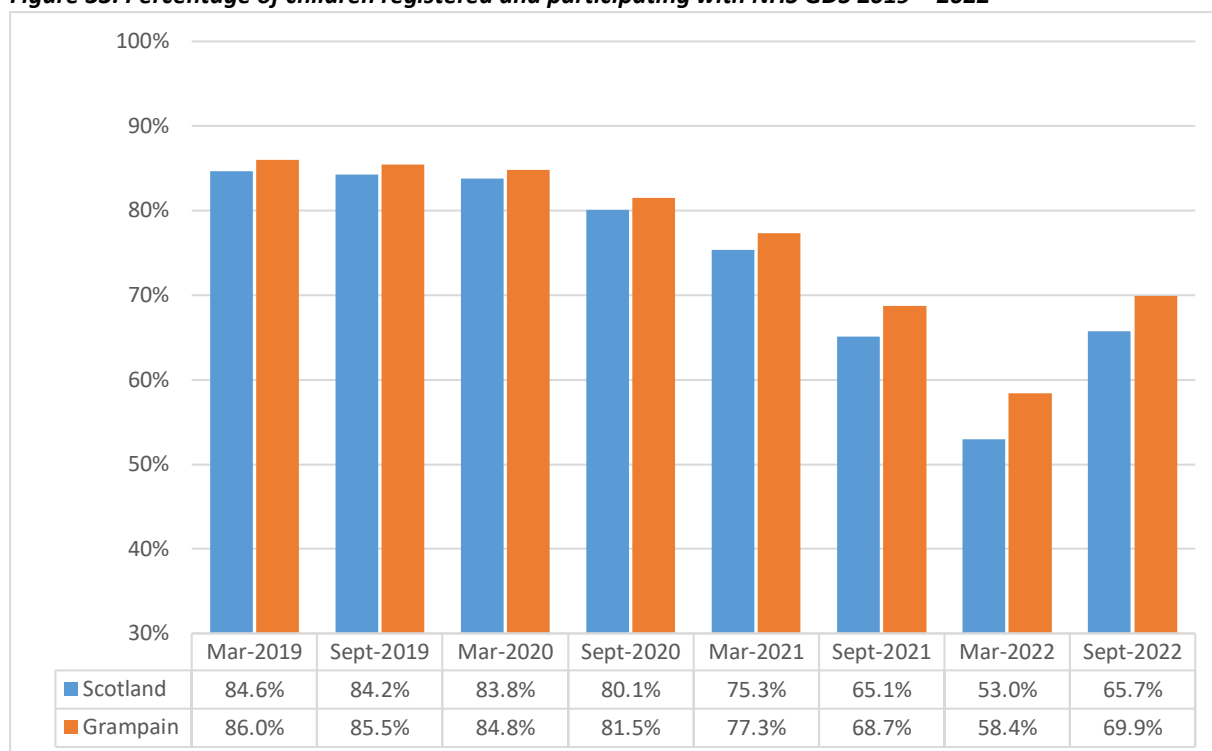
Access has become a key problem for both primary and secondary care NHS dental services following Covid-19 restrictions and remains one of the biggest challenges facing health boards across the country.

Figure 33 (next page) shows the percentage of children registered and participating with NHS General Dental Services from 2019 until 2022 and highlights how significant the reduction in activity levels for children has been, both in Grampian and across the country. In 2019, 86% of children registered participated in NHS dental services, however by March 2022 this had dropped to only 58.4% of children participating. A positive trend is that this number has started to increase again, rising to nearly 70% participation across Grampian in September 2022.

It is important to highlight that from March 2019 to September 2022, Grampian consistently had a higher percentage of children registered and participating in NHS dental services in comparison to the national average. Between March 2019 and September 2020, participation rates for children in Grampian were on average 1.3% higher than the national average, however during the period of recovery from March 2021 to September 2022 this has risen to an average of 3.8% higher.

While it is positive that Grampian has a higher percentage of children participating in dental services than the Scottish average, both registration and participation rates remain considerably below pre-pandemic levels.

Figure 33: Percentage of children registered and participating with NHS GDS 2019 – 2022 ⁶¹

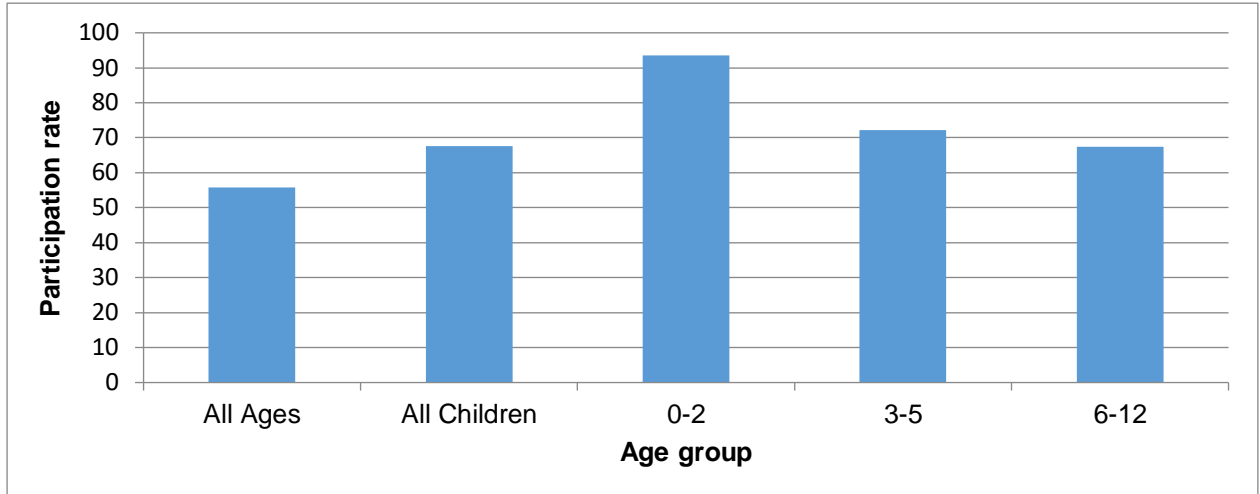


As participation is measured over 2 years of attendance at the dentist, there is a lag in available data, which may account for the significant drop in participation only being identified in March 2022. However, another positive trend is that national and local participation rates are increasing again, and this will be a focus for further analysis as more data is released.

Figure 34 (next page) shows that there is considerable variation in participation rates between different age groups in Grampian. The average participation rate for all ages was 55.7%, while the rate of child participation was higher at 67.7%. Consideration should be given to how to improve this for all ages going forward and try to ensure that as many children as possible have access to NHS dental services in the future.

It is promising to highlight that 93.5% of children registered with an NHS dentist in the 0-2 age category are actively participating in NHS dental services, however, they also have the lowest registration rate of any age group. This demonstrates that while there is a cohort of patients, and parents, who are motivated to attend general dental services, substantial work needs to be done to improve the registration rates for the wider 0-2 year olds, and overall engagement with dentists for this age group.

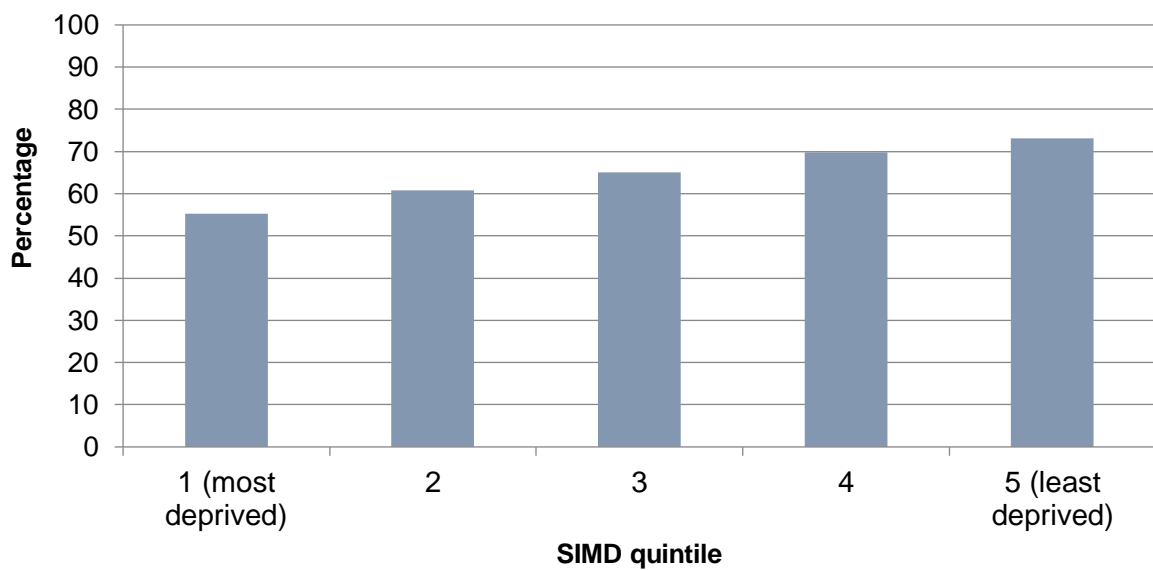
Figure 34: Percentage of the registered patients participating with NHS GDS in Grampian; by age group ⁶⁰



Participation and SIMD

Deprivation also plays a significant role in attendance and participation with an NHS dentist amongst children, often reinforcing the extent of oral health inequalities across the country. Figure 35 (below) illustrates the participation rates of children in Scotland, with a difference of 17.8% in participation between the most affluent area (SIMD 5 – 73.1%) and the most deprived (SIMD 1 – 55.3%).

Figure 35: Percentage of registered children patients participating in GDS in 2022; Scotland ⁶⁰



In 2022, more affluent areas in Grampian were above the national average for participation. SIMD 3 areas had an average participation rate of 69.4%, SIMD 4 at 73% and SIMD 5 areas were at 74.5%. This ascending pattern is in line with Scottish-wide data and shows that children from the least deprived areas are more likely to attend and participate in dental services in comparison to those from areas of higher deprivation.

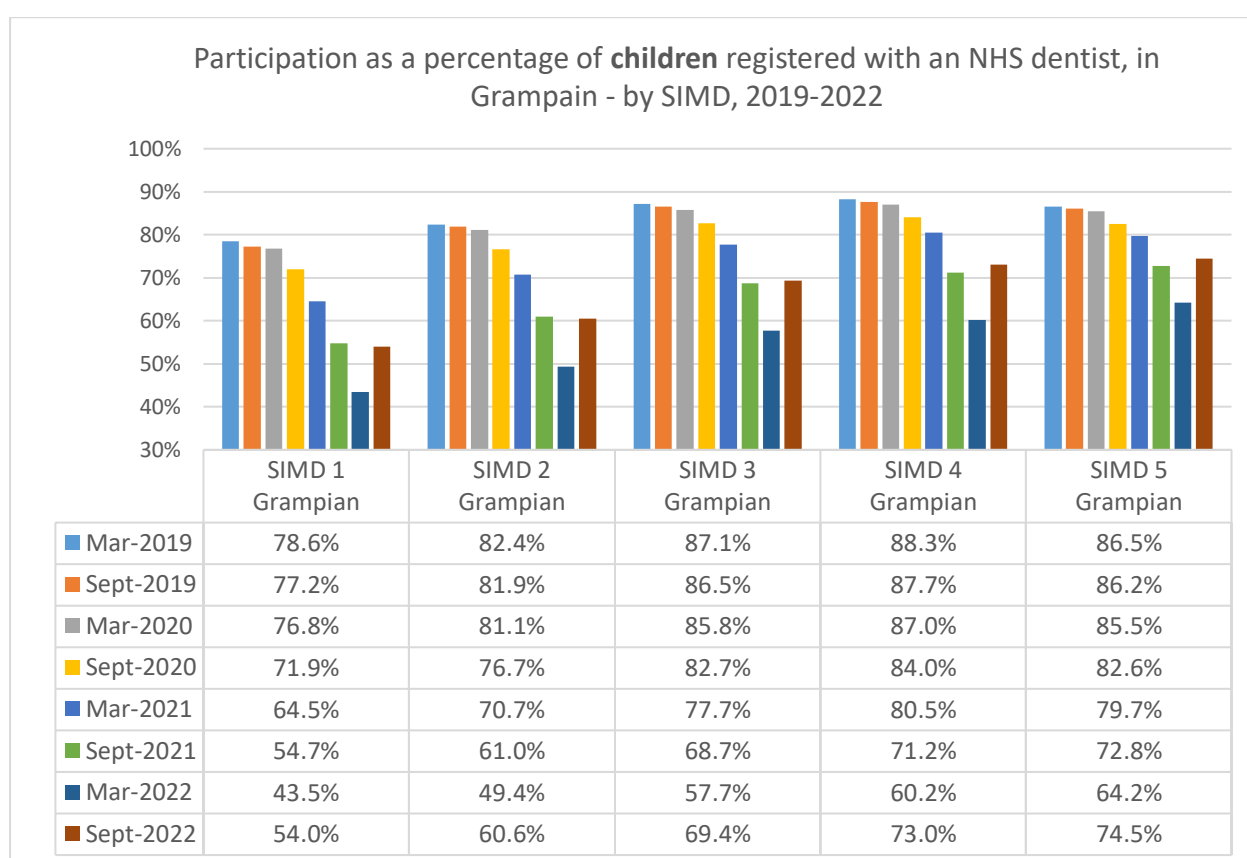
Oral health inequalities are still extremely prevalent in Grampian however, with both SIMD 1 and 2 areas falling below the national average. SIMD 1 areas were the second lowest in the country in

terms of participation at only 54%, 1.3% below the Scottish average. SIMD 2 areas reported only marginally better participation rates at 60.6%

Figure 36 (below) shows this trend in participation rates across each SIMD quintile from 2019 to 2022. This graph illustrates that the pandemic has reduced the participation of children in NHS dental services, with the most significant drop coming in the most deprived areas.

An interesting observation from Figure 36 is that the difference in participation between March 2022 and September 2022 was lowest in the most deprived (SIMD 1) and least deprived (SIMD 5) areas. SIMD 2 areas were able to improve their participation by 11.2% during this period while SIMD 3 areas recovered 11.7% and SIMD 4 areas improved an incredible 12.8%. This is in contrast to SIMD 1 and 5 areas that only recovered 10.5 and 10.3% respectively.

Figure 36 – Participation as a percentage of Children registered with an NHS dentist, in Grampian, by SIMD, 2019 – 2022 ⁶¹



Because of the 2 year lag in available, accurate data, it is difficult to give a timely representation of NHS dental participation, especially as these statistics are only published by Public Health Scotland once per year. As highlighted previously, participation rates have increased significantly from March 2022 to September 2022, which is an encouraging sign of recovery to pre-pandemic levels. These participation rates are a key indicator for access to NHS dental services, reinforcing the importance of ongoing monitoring of the trends in these statistics, using pre-pandemic levels of engagement as a baseline.

Childsmile Co-Design Feedback Matrix

Significant efforts were made to engage stakeholders and the population in this needs assessment. Staff surveys were distributed to the Childsmile teams working across Grampian to capture their views on the strengths and weaknesses of the current service provision, as well as provide a platform for them to make suggestions on how to improve this service delivery.

Table 3 (below) summarises the findings of the responses from the Childsmile teams into a SWOT analysis matrix. The key themes identified from the questionnaire are outlined in Appendix 2.

Strengths	Weaknesses
<ul style="list-style-type: none"> - Existing community engagement through Childsmile - Outreach to new locations like libraries, and community centres and liaising with hospital staff to support vulnerable inpatients - Team-working - Effective team management 	<ul style="list-style-type: none"> - Establishments not engaging with the programme (lack of staff and buy-in to support toothbrushing/FVA) - Lost engagement of hard to reach families during school holidays - Distance some patients have to travel for NHS care - Old equipment (phones/uniforms)
Opportunities	Threats
<ul style="list-style-type: none"> - Finding enough space to deliver fluoride varnish - More dentists available to register NHS patients - Importance of engaging with other professional + 3rd sector groups <ul style="list-style-type: none"> o New parent maternity groups o Health-related organisations o Commercial organisations – cafes and supermarkets - More training around day-to-day role and diet - Resources – non-generic stickers for hands-on engagement - Visual aids to open up discussions 	<ul style="list-style-type: none"> - Access to an NHS dentist and patients having to pay privately for treatment - Long general anaesthetic waiting lists - High sugar diets and Cost of food/living - Buy in from parents and schools - Challenges maintaining relationships with education establishments - Lack of follow up available to CS teams after dental visits

Recommendations for Improving Children's Oral Health in Grampian

- 1. Improve access and participation of children in dental services particularly in deprived communities.**
 - a. Working with General Dental Practitioners (GDPs) to identify practices able to register children patients including those referred by Childsmile and Health Visitor teams.
 - b. Engaging with the Local Dental Committee and GDPs to identify opportunities to improve access - working with contractors to show the material and financial benefit of delivering prevention.
 - c. Promote "Shared Care" arrangements for children on dental general anaesthetic waiting list – encouraging GDPs to maintain attempts to deliver prevention advice whilst they are on the waiting list.

- 2. Improve the uptake of the Childsmile programme in nurseries and primary schools**
 - a. Develop a pathway between Childsmile teams and education sector, in each HSCP, to identify barriers to engagement from establishments and work together to promote uptake of toothbrushing and fluoride varnish.
 - b. Seek sustained improvement in uptake of Childsmile programme in education establishments particularly in deprived communities.

- 3. Enhanced oral health promotion prior to/post general anaesthetic**
 - a. Explore opportunities for Childsmile involvement in the management of paediatric GA patients.
 - b. Developing a "Collective Story" for NHSG around oral health, to be promoted across all services.
 - c. Illustrate the journey of child going for a GA – what factors have led the child to this stage, what are the responsibilities of everybody in this journey / what could we do differently to prevent this occurring?

- 4. Closer collaboration of public health work streams on diet/child healthy weight and oral health**
 - a. Utilising the common risk factor approach to collaborate with the child healthy weight (CHW) programme and other local partners to promote healthy diet and weight.

- 5. Pre + Post-Natal Engagement (Parents and Children)**
 - a. Working closely with health visitors, peer support volunteers, social work and midwives to promote oral health and healthy maternal and infant nutrition to ensure the best start in life for children.
 - b. Test of change ideas to promote oral health through established networks (breastfeeding, peer support, ante-natal classes).

- 6. Improved data sharing with support from Health Intelligence**
 - a. Integration of key children's oral health indicators into the NHSG dashboard on health inequalities.

- 7. Continued focus on oral health education**
 - a. Identifying new opportunities to deliver effective oral health education
 - b. Delivering training opportunities for GDCs/PDS clinicians to improve their knowledge and skills around children's oral health - encouraging the patients and parents to become more actively involved in their care.

- 8. Potential topics/areas for further research and exploration**
 - a. Build understanding/consensus on the challenges with 0-2 registration and participation
 - b. Develop better understanding of the barriers and enablers to engaging with children with additional support needs
 - c. Investigate the oral health preferences of different ethnic groups in NHS

- 9. Tackle the wider determinants of oral health and inequality**
 - a. Advocate for a national strategy/framework to address the adverse impacts of commercial determinants of health
 - b. NHS Strategic level – Engaging national and local partners or stakeholders to understand how to tackle the commercial determinants of health in Grampian.

References

1. Chestnutt I, Morgan MZ, Monaghan NP, Collins L. AN overview of oral health needs assessments - to support NICE public health guidance, "Oral health :... ResearchGate [Internet]. 2013 Sep 3; Available from: [https://www.researchgate.net/publication/308725046 AN overview of oral health needs assessments to support NICE public health guidance Oral health local authority strategies to improve oral health particularly among vulnerable groups](https://www.researchgate.net/publication/308725046_AN_overview_of_oral_health_needs_assessments_to_support_NICE_public_health_guidance_Oral_health_local_authority_strategies_to_improve_oral_health_particularly_among_vulnerable_groups) (Accessed 04 Jan 24)
2. Wright J, Williams R, Wilkinson J. Health needs assessment: Development and importance of health needs assessment. The BMJ [Internet]. 1998 Apr 25;316(7140):1310–3. Available from: <https://doi.org/10.1136/bmj.316.7140.1310> (Accessed 04 Jan 24)
3. World Health Organization: WHO. Landmark global strategy on oral health adopted at World Health Assembly 75 [Internet]. 2022. Available from: <https://www.who.int/news-room/feature-stories/detail/landmark-global-strategy-on-oral-health-adopted-at-world-health-assembly-75> (Accessed 04 Jan 24)
4. Ridsdale L, Gilchrist F, Balmer R, Skelton R, Sidebotham P, Harris J. British Society of Paediatric Dentistry: A policy document on dental neglect in children. International Journal of Paediatric Dentistry [Internet]. 2023 Sep 25; Available from: <https://doi.org/10.1111/ipd.13120> (Accessed 04 Jan 24)
5. Oral Health Needs Assessment for Children and Young People [Internet]. West Sussex JSNA Website. 2023. Available from: <https://jsna.westsussex.gov.uk/reports/subject-specific-needs-assessments/oral-health/> (Accessed 04 Jan 24)
6. *International Association For Dental Traumatology. Dental Trauma Guidelines - Revised 2011.* <https://www.iadt-dentaltrauma.org/1-9%20%20iadt%20guidelines%20combined%20-%20lr%20-%2011-5-2013.pdf> (Accessed: 04 January 2024).
7. NHS England. Delivering better oral health -Chapter 5: Periodontal diseases [Internet]. GOV.UK. 2022. Available from: <https://www.gov.uk/government/publications/delivering-better-oral-health-an-evidence-based-toolkit-for-prevention/chapter-5-periodontal-diseases> (Accessed 04 Jan 24)
8. Population Estimates of Scotland - National Records of Scotland [Internet]. Available from: <https://scotland.shinyapps.io/nrs-population-estimates/> (Accessed 04 Jan 24)
9. Public Health Scotland. Population Estimates - Health and Social Care Partnership (2019) Population estimates - Scottish Health and Social Care Open Data [Internet]. Available from: <https://www.opendata.nhs.scot/dataset/population-estimates/resource/c3a393ce-253b-4c75-82dc-06b1bb5638a3> (Accessed 04 Jan 24)
10. The Scottish Government. Scottish Government Urban Rural Classification 2020 [Internet]. The Scottish Government. 2022. Available from: <https://www.gov.scot/publications/scottish-government-urban-rural-classification-2020/pages/2/> (Accessed 04 Jan 2024)
11. Public Health Scotland. Population Estimates - Open Data Scotland [Internet]. Open Data Scotland. Available from: <https://opendata.scot/datasets/public+health+scotland-population+estimates/> (Accessed 04 Jan 2024)
12. The North East Alliance. Director of Public Health Annual Report 2022. NHS Grampian, 2022. Available from: <dph-report-final.pdf> (nhsgrampian.org). (Accessed 04 Jan 2024)
13. Public Health Scotland. SIMD (Scottish Index of Multiple Deprivation) [Internet]. Scottish Index of Multiple Deprivation. Available from: <https://simd.scot/#/simd2020/BTTTT/9/-4.0000/55.9000/> (Accessed 04 Jan 2024)
14. Grampian Regional Equality Council. Demographics [Internet]. Grampian, Grampian Regional Equality Council. 2020 [Cited 2024 Jan 04]. Available from: <https://grec.co.uk/hfines-demographics/>
15. Grampian Regional Equality Council. *Ethnic minority per cent of the population, 2004-2020.* (2020). [Internet]. Grampian, Grampian Regional Equality Council. 2020 [Cited 2024 Jan 04]. Available from: <https://grec.co.uk/hfines/em-population-2004-2020/>
16. Public Health Scotland. National Dental Inspection Programme (2022) - Report of the 2022 Basic Inspection of Primary 1 Children. Available from: [National Dental Inspection Programme \(NDIP\) 2022 \(scottishdental.org\)](https://www.scottishdental.org) (Accessed 04 Jan 2024)
17. Public Health Scotland. National Dental Inspection Programme (2023) - Report of the 2023 Detailed Inspection Programme of Primary 7 Children and the Basic Inspection of Primary 1 and Primary 7 Children. Available from: [National Dental Inspection Programme \(NDIP\) 2023 \(publichealthscotland.scot\)](https://www.scottishdental.org) (Accessed 04 Jan 2024)

18. Public Health England. Tackling Poor Oral Health in Children – Local Government’s Public Health Role (2016). London. Public Health England, 2016. (Accessed 05 Jan 2024)
19. Institute for Fiscal Studies. Living Standards, Poverty and Inequality in the UK – 2022. Institute for Fiscal Studies, 2022. Available from: [R215-Living-standards-poverty-and-inequality-in-the-UK-2022.pdf \(ifs.org.uk\)](#). (Accessed 05 Jan 2024)
20. NHS Grampian, Aberdeenshire Council. Aberdeenshire Child Poverty Local Action Report 2019 – 2022. NHS Grampian, 2020. Available from: [Aberdeenshire Child Poverty Local Action Report \(nhsgrampian.org\)](#) (Accessed 05 Jan 2024).
21. Public Health Scotland. Scottish Burden of Disease Study – Forecasting the future burden of disease: incorporating the impact of demographic transition over the next 20 years. ScotPHO, November 2022. Available from: [Scottish Burden of Disease Forecasting Briefing \(scotpho.org.uk\)](#) (Accessed 05 Jan 2024).
22. Aminu A, McMahon A, Clark C, Sherrif A, Buchanan C, Watling C, Mahmoud A, Culshaw S, Mackay W, Gorman M, Braid R, Edwards M and Conway D*1. Inequalities in access to NHS primary care dental services in Scotland during the COVID-19 pandemic. *British Dental Journal*, 2023. Available from: [Inequalities in access to NHS primary care dental services in Scotland during the COVID-19 pandemic | British Dental Journal \(nature.com\)](#). (Accessed 05 Jan 2024)
23. Public Health England. The relationship between dental caries and body mass index – Child Level Analysis. Public Health England, London. 2019. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/844121/BMI_dental_caries.pdf (Accessed 05 Jan 2024)
24. Manohar N, Hayen A, Fahey P, Arora A. Obesity and dental caries in early childhood: A systematic review and meta-analyses. *Obes Rev*. 2020 Mar;21(3):e12960. doi: 10.1111/obr.12960. Epub 2019 Nov 13. PMID: 31721413. (Accessed 05 Jan 2024)
25. World Cancer Research Fund. The link between food, nutrition, diet and non-communicable diseases. The NCD Alliance, London. 2014. Available from: [WCRF-NCD-A4-WEB.pdf](#) (Accessed 05 Jan 2024)
26. Royal College of Paediatrics and Child Health. Child health inequalities driven by child poverty in the UK - position statement [Internet]. RCPCH. Available from: <https://www.rcpch.ac.uk/resources/child-health-inequalities-position-statement> (Accessed 05 Jan 2024)
27. NHS Grampian Public Health. Ten Facts About Population Health in Grampian. Aberdeen: NHS Grampian, 2022. Available from: <https://www.sgul.ac.uk/about/our-professional-services/information-services/library/documents/help-documents/helpsheets-pdfs/Referencing-Vancouver-guide-v12.pdf> (Accessed 05 Jan 2024)
28. Gilmore A, Fabbri A, Baum F, Bertscher A, Bondy K, Chang H-J, et al. Defining and conceptualising the commercial determinants of health. *Lancet* [Internet]. 2023 [cited 05 Jan 2024]; Volume 401, Issue 1038. Available from: DOI: [https://doi.org/10.1016/S0140-6736\(23\)00013-2](https://doi.org/10.1016/S0140-6736(23)00013-2)
29. Peres M, Macpherson L, Weyant R, Daly B, Venturelli R, Mathur M, et al. Oral Diseases: A Global Public Health Challenge. *Lancet* [Internet]. 2019 [cited 05 Jan 2024]; Volume 394, Issue 10194, P249-260, July 20, 2019. Available from: [Oral diseases: a global public health challenge - The Lancet](#)
30. Theriault, H., Bridge, G. Oral health equity for rural communities: where are we now and where can we go from here? *Br Dent J* **235**, 99–102 (2023). <https://doi.org/10.1038/s41415-023-6058-4> (Accessed 05 Jan 2024).
31. Scottish Public Health Observatory. ScotPHO profiles [Internet, Cited 14/2/24]. Shinyapps.io. 2020. Available from: https://scotland.shinyapps.io/ScotPHO_profiles_tool/
32. Arrow P, Raheb J, Miller M. Brief oral health promotion intervention among parents of young children to reduce early childhood dental decay. *BMC Public Health*. 2013 Mar 20;13:245. doi: 10.1186/1471-2458-13-245. PMID: 23509932; PMCID: PMC3610190.
33. Deghatipour, M., Ghorbani, Z., Mokhlesi, A.H. *et al.* Community-based interventions to reduce dental caries among 24-month old children: a pilot study of a field trial. *BMC Oral Health* **21**, 637 (2021). <https://doi.org/10.1186/s12903-021-01999-x>
34. Akera, P., Kennedy, S.E., Lingam, R. *et al.* Effectiveness of primary school-based interventions in improving oral health of children in low- and middle-income countries: a systematic review and meta-analysis. *BMC Oral Health* **22**, 264 (2022). <https://doi.org/10.1186/s12903-022-02291-2>
35. Bramantoro T, Santoso CMA, Hariyani N, Setyowati D, Zulfiana AA, Nor NAM, Nagy A, Pratamawari DNP, Irmalia WR. Effectiveness of the school-based oral health promotion programmes from preschool to high school: A systematic review. *PLoS One*. 2021 Aug 11;16(8):e0256007. doi: 10.1371/journal.pone.0256007. PMID: 34379685; PMCID: PMC8357156.

36. Scottish Government. A guide to implementing the Nutritional Requirements for Food and Drink in Schools (Scotland) regulations 2020. Edinburgh: Scottish Government, 2020. Available from: [Healthy Eating in Schools: Guidance 2020 \(www.gov.scot\)](https://www.gov.scot/resources/consultations-petitions/Publications/2020-01-Health-Eating-in-Schools-Guidance-2020.pdf) (Accessed 05 Jan 2024).
37. Sherriff A, Stewart R, Macpherson LMD, et al. Child oral health and preventive dental service access among children with intellectual disabilities, autism and other educational additional support needs: A population-based record linkage cohort study. *Community Dent Oral Epidemiol.* 2023; 51: 494-502. doi: [10.1111/cdoe.12805](https://doi.org/10.1111/cdoe.12805) (Accessed 05 Jan 2024).
38. Scottish Government. Looked After Children Guidance [Internet]. The Scottish Government. Available from: <https://www.gov.scot/policies/looked-after-children/> (Accessed 05 Jan 2024)
39. NHS England. Delivering Better Oral Health - An Evidence-Based Toolkit for Prevention [Internet]. Office for Health Improvement and Disparities, editor. 2014 [cited 2024 Feb]. Available from: <https://www.gov.uk/government/publications/delivering-better-oral-health-an-evidence-based-toolkit-for-prevention>
40. Hong J, Whelton H, Douglas G, Kang J. Consumption frequency of added sugars and UK children's dental caries. *Community Dent Oral Epidemiol.* 2018 Oct;46(5):457-464. doi: [10.1111/cdoe.12413](https://doi.org/10.1111/cdoe.12413). Epub 2018 Aug 20. PMID: 30125961. (Accessed 05 Jan 2024)
41. Lomann M, Almudena Claassen M, Papias E. The influence of COVID-19 lockdown in the UK on the consumption of sugar-sweetened beverages and water. *Appetite*, Volume 169, 2022, 105497, ISSN 0195-6663. <https://doi.org/10.1016/j.appet.2021.105497>. (<https://www.sciencedirect.com/science/article/pii/S0195666321004049>) (Accessed 23/1/23)
42. Tham R, Bowatte G, Dharmage SC, Tan DJ, Lau MX, Dai X, Allen KJ, Lodge CJ. Breastfeeding and the risk of dental caries: a systematic review and meta-analysis. *Acta Paediatr.* 2015 Dec;104(467):62-84. doi: [10.1111/apa.13118](https://doi.org/10.1111/apa.13118). PMID: 26206663.
43. Abanto J, Maruyama JM, Pinheiro E, Matijasevich A, Antunes JLF, Bönecker M, Cardoso MA; MINA-Brazil Study Group. Prolonged breastfeeding, sugar consumption and dental caries at 2 years of age: A birth cohort study. *Community Dent Oral Epidemiol.* 2023 Jun;51(3):575-582. doi: [10.1111/cdoe.12813](https://doi.org/10.1111/cdoe.12813). Epub 2022 Nov 15. PMID: 36380436.
44. Paglia L. Does breastfeeding increase the risk of early childhood caries? *Eur J Paediatr Dent.* 2015 Sep;16(3):173. PMID: 26418916.
45. Avila WM, Pordeus IA, Paiva SM, Martins CC. Breast and Bottle Feeding as Risk Factors for Dental Caries: A Systematic Review and Meta-analysis. *PLoS One.* 2015 Nov 18;10(11):e0142922. doi: [10.1371/journal.pone.0142922](https://doi.org/10.1371/journal.pone.0142922). PMID: 26579710; PMCID: PMC4651315.
46. Edwards M, Symeonoglou P. (2017). SDNAP Oral Health and Dental Services for Children Needs Assessment Report. [10.13140/RG.2.2.17690.44483](https://www.gov.scot/resources/consultations-petitions/Publications/2017-02-SDNAP-Oral-Health-and-Dental-Services-for-Children-Needs-Assessment-Report.pdf).
47. Hospital Dental Service (HDS) - Dental care - Primary care - Our areas of work - Public Health Scotland [Internet]. [publichealthscotland.scot](https://publichealthscotland.scot/our-areas-of-work/primary-care/dental-care/hospital-dental-service-hds/). [cited 2024 Jan 23]. Available from: <https://publichealthscotland.scot/our-areas-of-work/primary-care/dental-care/hospital-dental-service-hds/>
48. Adewale L, Morton N, Blayney M. Guidelines for the management of children referred for dental extractions under general anaesthesia. British Society of Paediatric Dentistry. Association of Paediatric Anaesthetists of Great Britain and Ireland, August 2011.
49. Dental statistics - fees and treatments - Statistics as of March 2020 - Dental statistics - fees and treatments - Publications - Public Health Scotland [Internet]. [publichealthscotland.scot](https://publichealthscotland.scot/publications/dental-statistics-fees-and-treatments/dental-statistics-fees-and-treatments-statistics-as-at-march-2020/). [cited 2024 Jan 24]. Available from: <https://publichealthscotland.scot/publications/dental-statistics-fees-and-treatments/dental-statistics-fees-and-treatments-statistics-as-at-march-2020/>
50. MacPherson L. Programme Manual for Childsmile Staff. NHS Scotland, Childsmile. 2014. Available from: [Contents Page \(healthscotland.com\)](https://www.healthscotland.com/resources/publications/Childsmile-Programme-Manual-for-Staff.pdf).
51. Public Health Scotland. Childsmile National Headline Data Report 2022. Scotland, Public Health Scotland; 2022. Available from:
52. Public Health Scotland. Childsmile National Headline Data Report 2023. Scotland, Public Health Scotland; 2023. Available from:
53. Health Informatics Centre (2023), Childsmile Core Programme - Establishments Participating in Toothbrushing Programme Report. Unpublished document.
54. Health Informatics Centre (2022), Childsmile Core Programme - Establishments Participating in Toothbrushing Programme Report. Unpublished document.
55. Health Informatics Centre (2023), Childsmile Nursery and School - Establishments Participating in Fluoride Varnish Programme Report. Unpublished document.

56. Health Informatics Centre (2022), Childsmile Nursery and School - Establishments Participating in Fluoride Varnish Programme Report. Unpublished document.
57. Health Informatics Centre (2022), Childsmile Practice Reports – Children Referred to DHSW from Different Sources Report. Unpublished document.
58. Health Informatics Centre (2023), Childsmile Nursery and School - Establishments Participating in Fluoride Varnish Programme Report. Unpublished document.
59. Public Health Scotland. Dental statistics - NHS registration and participation - Publications - Public Health Scotland [Internet]. [publichealthscotland.scot](https://publichealthscotland.scot/publications/dental-statistics-registration-and-participation/dental-statistics-nhs-registration-and-participation-25-january-2022). Available from: <https://publichealthscotland.scot/publications/dental-statistics-registration-and-participation/dental-statistics-nhs-registration-and-participation-25-january-2022>
60. Public Health Scotland. Dental Statistics – NHS Registration and Participation – Statistics up to 30 September 2021. Scotland, Public Health Scotland; January 2022.
61. NHS Grampian. Registration and Participation in 2019-2020 – Local Analysis by SIMD. Unpublished report. 2022
62. Child Health Team. Primary 1 Body Mass Index Statistics, Scotland. Public Health Scotland; 2022
63. Public Health Scotland. Population Estimates: Young and Old. PHS; 2021 [cited 14 Feb 24]. Available from: <https://statistics.gov.scot/slice?dataset=http%3A%2F%2Fstatistics.gov.scot%2Fdata%2Fpopulation-estimates-young-and-old&http%3A%2F%2Fpurl.org%2Flinked-data%2Fcube%23measureType=http%3A%2F%2Fstatistics.gov.scot%2Fdef%2Fmeasure-properties%2Fpercent&http%3A%2F%2Fpurl.org%2Flinked-data%2Fsdmx%2F2009%2Fdimension%23refPeriod=http%3A%2F%2Freference.data.gov.uk%2Fid%2Fyear%2F2020&http%3A%2F%2Fstatistics.gov.scot%2Fdef%2Fdimension%2Fage=http%3A%2F%2Fstatistics.gov.scot%2Fdef%2Fconcept%2Fage%2Fchildren-under-16-years>
64. Scottish Public Health Observatory. ScotPHO profiles [Internet, Cited 14/2/24]. Shinyapps.io. 2020. Available from: https://scotland.shinyapps.io/ScotPHO_profiles_tool/
65. World Health Organization. Breastfeeding [Internet]. World Health Organization. 2021. Available from: https://www.who.int/health-topics/breastfeeding#tab=tab_2
66. NHS Grampian. Dental Referrals to Public Dental Service from the General Dental Service. Unpublished report. 2023.
67. NHS Grampian. General Anesthetic Waiting List Report. Unpublished Report. 2023
68. Public Health Scotland. Health in the Early Years in Scotland (HEYS) Dashboard. Public Health Scotland; 2024 [cited 2024 Feb 14]. Available from: <https://scotland.shinyapps.io/phs-health-in-the-early-years-in-scotland/>

Appendixes

Appendix 1: Scottish Government Urban Rural Classification – 6 Fold

Class	Class Name	Description
1	Large Urban Areas	Settlements of 125,000 people and over.
2	Other Urban Areas	Settlements of 10,000 to 124,999 people.
3	Accessible Small Towns	Settlements of 3,000 to 9,999 people, and within a 30 minute drive time of a Settlement of 10,000 or more.
4	Remote Small Towns	Settlements of 3,000 to 9,999 people, and with a drive time of over 30 minutes to a Settlement of 10,000 or more.
5	Accessible Rural Areas	Areas with a population of less than 3,000 people, and within a 30 minute drive time of a Settlement of 10,000 or more.
6	Remote Rural Areas	Areas with a population of less than 3,000 people, and with a drive time of over 30 minutes to a Settlement of 10,000 or more.

Appendix 2: SWOT analysis results from thematic analysis of the questionnaire to Childsmile Dental Health Support Workers

Strengths

Participants reported that community engagement and the presence of Childsmile team members in the community is one of the biggest strengths of the programme delivery. In particular, the increase in this work has contributed to more parents and professionals being aware of the role Childsmile plays in the wider context of the NHS:

“We have a strong presence in our local community due to our uptake in community work and feel parents and other professionals are aware of what the child smile role is within the NHS”

Multiple participants mentioned the work that has been done recently to widen the search for groups that can be supported by the Childsmile team, including libraries, and community centres as well as liaising with hospital staff to support vulnerable inpatients.

Teamwork was another strength consistently highlighted by participants, including the importance of knowledgeable staff that support each other. Participants reported this full team approach, as well as an informal method of delivering advice, allowed them to be flexible in how they tailor the sessions they deliver to the needs of each family:

All staff get involved with community engagement. We keep these sessions informal so that we can tailor them to each family. This gives us a chance to chat 1-1 with families who then feel more comfortable to open up and share any struggles they may be facing. Staff feel more confident

adopting this approach as opposed to a formal OH talk where parents sit around and just listen to us relay key OH messages to everyone at the same time.

Several comments focussed on the impact of having an effective team manager to drive forward the programme, harnessing the skills of individual team members by listening to them and understanding their strengths and weaknesses to get the most out of them and have them feel valued. Another important element identified to make this successful was communication, as well as the referrals received from health visitors to the programme.

Weaknesses

Establishments not engaging with Childsmile was the most frequently identified barrier to delivering the programme across all HSCPs. The majority of the participants (16) made some mention of the challenges they faced securing engagement with certain establishments. Many focussed on the lack of staff available in nurseries and primary schools to consistently deliver the toothbrushing programme while some highlighted that staff have several other tasks to complete and toothbrushing can often drop as a priority amidst a tight daily schedule as a result. Due to existing pressures on local authority schools, participants also felt that oral health is not a consistent priority that is targeted by teachers, with some suggesting that toothbrushing should be supported to be mandatory to improve engagement.

Another consistent theme identified through participants' responses was poor equipment, predominantly focusing on unsuitable models of mobile phones and formal uniforms. The majority focussed on the impact that not having access to a smartphone can impact on their ability to do their job. Limitations included problems signposting parents to relevant phone applications without access to demonstrate the use of the app and challenges communicating directly with parents they are trying to support

The main issue here is communication with families who have been referred to us for home/practice support, these old-style phones are difficult to text with or have a continuation of communication feed, also unable to show apps we recommend or signpost with.

Several highlighted that the uniform can often act barrier to engagement as they remind children of other healthcare professionals, with some participants suggesting a more informal approach:

“Our uniform is too formal and denotes a health care worker which can be frightening for children and off-putting for parents/adults and be confusing about our role. While acknowledging that a uniform is necessary I feel it should be different to a general health care worker.”

The teams also identified the lack of dentists available to refer patients to as the 3rd most consistent barrier to delivering the Childsmile Programme. As well as the ongoing recruitment and retention issues across the dental sector, there has also been a significant increase in the number of de-registrations over the last 12 months and this is having an impact on the team's ability to register patients at their local dental practice:

“Not being able to get NHS registration is a huge hurdle. People don't have the resources to go private or travel many miles to see a dentist. Lots of people are disappointed that we can't help them get dental access locally”

Participants also highlighted the distances that need to be travelled for some children to access NHS care are unrealistic. The majority of patients in rural areas in Grampian have to travel longer

distances to access care, however, the cost of living affects patient's ability to pay for public transport, which can act as a barrier to attending the dentist:

The nearest available GDP taking on new NHS patients is 30 miles away. A lot of Families that are referred to us do not have transport and cannot afford public transport or would find it difficult. If referred for a General Anaesthetic, getting to the hospital would require leaving very early in the morning and several bus changes.

A final barrier consistently identified by participants was challenges engaging with hard-to-reach families in the community and the fact that groups targeted by Childsmile often stop during holiday times.

Opportunities

Improvements with equipment and resources were identified by participants as key to facilitating their job role going forward. The most common feedback was related to mobile phones and their potential to improve communication with parents, as well as facilitating internet access for maps for travelling between schools.

Other participants highlighted challenges in finding enough space in some schools to deliver fluoride varnish applications – which varied across the region. Another regular suggestion as an opportunity to improve CS delivery was to consider a mobile dental unit or van that could be flexible to the needs of rural communities and potentially offer a space for oral health assessments for young children in hard-to-reach groups:

I feel reverting to a mobile dental unit for use at schools would greatly help. (This) would remove the issue of parents not taking children to appointments (and) would offer a more bespoke dental service to children.

While the lack of NHS dentists registering patients was consistently identified as a barrier to the current model for delivery, many participants felt that more dentists with more availability for teams to be able to direct patients to would be an opportunity to improve the oral health of Children in Grampian.

Participants also highlighted the importance of engaging with other professional groups, including engaging with all third-sector organisations focussed on children across Grampian. Another suggestion included delivering oral health training to teach staff about key preventative measures and the importance of OH. This was supplemented by a suggestion to deliver dental trauma training to PE teachers and sports team nurses as a way to “help them know what to do in the situation of a tooth getting knocked out”.

Some participants reported they would benefit from more training around the responsibilities and tasks within the day-to-day role of a dental health support worker. This included topics like the consent process and the HIC system to input the relevant data, or possibly even the opportunity to have access to clinical training. One participant reported they wanted to:

“Feel more comfortable and educated on the information someone at DHSW level is supposed to know and deliver”.

Linked to the commercial determinants of health, some participants suggested engaging parents with cooking classes to improve their understanding of nutritious meals that can be delivered on a

budget for the whole family. One suggestion focussed on collaborating with schools to involve the children in these cooking classes, alongside limiting sugary snacks, drinks and junk food in all educational establishments

Specific feedback was given around the resources that the Childsmile teams felt helped the most to get engagement from children.

The resources for hands-on and practical activities were deemed essential by a number of participants, highlighting that children enjoy and learn the most from “activities they can participate in”. Puppets were highlighted as a useful tool for engaging young children to engage with oral health messages, as they could demonstrate brushing in a fun way.

Stickers were most frequently identified by participants (14) as a resource that helps engage with children the best. Any variety of Marvel/Superhero/Disney stickers was viewed as being more effective for engagement than the standard issue Childsmile ticket.

“The new stickers have been a big hit with the children receiving fluoride varnish”.

Visual aids were also frequently reported as an important tool to drive engagement. Tooth models were identified as an effective way of highlighting the process of gradual dental decay as well as providing a platform to “open up discussion about fillings and braces”. Puppets were highlighted as a useful tool for engaging young children to engage with oral health messages, as they could demonstrate brushing in a fun way. Other suggestions focussed on games, colouring in books and crafts, as well as using toothbrush timers for children of all ages.

Storybooks were also highlighted as a useful tool, however, participants reported that there is only a limited supply of suitable resources that children could benefit from.

It was suggested that children with additional support needs would benefit from the opportunity to access a variety of toothbrushes to improve their engagement as well as more time to support activities like demonstrating brushing techniques. Another suggestion for children with ASN was that:

“Every ASN base in nurseries, schools and high schools to brush (daily). The majority of these parents have huge time restrictions in the morning before transport arrives, and toothbrushing can easily be missed... (so) if all the ASN bases are brushed this would have a huge benefit to the children.

Team suggestion for targets of Community Outreach:

A variety of different community groups were identified by participants as potential targets for oral health promotion in the community. These included dental trauma training for sports groups and working with groups like Home Start, Brownies, Guides, Scouts and other youth groups, including Sunday schools. This was also supplemented by suggestions to target breakfast and afterschool clubs in education establishments,

New parent and maternity groups

Participants highlighted toddler groups and NHS Breastfeeding groups for young mums or new mums. It was also suggested that teen mums, particularly from deprived communities, could also be targeted, as well as people who are cared for at home – both the carer and the person being cared for.

Health Related Organisations:

Participants suggested that engagement should be sought through other paediatric healthcare departments, including Occupational therapy, rheumatology and clinics that work with families of children with complex medical histories. One also suggested that more work should be done to engage with social workers and family support workers.

There must also be more opportunities to work alongside colleagues in different healthcare departments, to reinforce key oral health messages and highlight the importance of oral health messages.

“Over the summer I've been working alongside the children's immunisation team in community settings. I found that first-time parents and young parents need education and direction on registering with a GDP when to start toothbrushing when to expect the eruption of teeth, diet, what drinks to give, hidden sugars, the importance of looking after deciduous teeth”

Commercial Organisations:

Cafes and soft play centres were also identified as key organisations for Childsmile to target going forward, as they provide the opportunity to offer a more informal approach to delivering oral health promotion. Another area highlighted was the importance of targeting big supermarkets:

“...Team up with supermarkets to deliver oral health messages. I earn points for healthy snack/food choices at home or earn points to win a prize... maybe a fun family activity day to be won”

Threats

Access to an NHS dentist was the most consistently rated threat or challenge to improving children's oral health, according to the responses from Childsmile teams in Grampian. One participant reported:

“Not having children registered with a dentist and no PDS registration for all children is the biggest barrier for us to find the families who would most benefit from oral health input.”

Several participants also described that it was regular to find families with no regular access to an NHS dentist and as a result, patients were having to pay for treatment privately, which they often couldn't afford. Participants stated that there were challenges in registering patients promptly across Grampian, however, reinforced the influence that education can have on preventing further dental disease in the interim period between visiting the dentist. Participants highlighted the importance of having strong buy-in from general dental practitioners in helping promote prevention and encouraged fostering stronger links with the local GDP community.

The long general anaesthetic waiting list time was also mentioned by some participants, particularly as some children and families face a 6-hour round trip as a result of the reduction in GA capacity at Dr Gray's Hospital following the pandemic.

Relating to the commercial determinants of health, many participants felt that the consistent prevalence of high-sugar foods was a significant threat to improving children's oral health going forward. In particular, the cost of living was identified as something likely to impact the diet of families who are already struggling to afford healthier alternatives. The ongoing cost of living issues was also thought to play a role in oral health not being seen as a priority, as families have to prioritise other issues like food security and household bills:

“(The) cost of food has increased so much, healthy food costs extra (and there is) also the cost of cooking it, (so) many just buy microwave meals. The diet is heavily affected”

Other participants identified a lack of buy-in from parents and nurseries or primary schools as a threat to improving children’s oral health. They recognised that it is difficult to get engagement with parents in areas of high deprivation when discussing messaging about healthy eating, because of how expensive that is currently. However several participants identified the importance of working with parents to take responsibility for not only their oral health but that of their child as well. It was reported that improving education for adults about the benefit of brushing twice daily could have a significant positive impact on the oral health of children, as it would help embed the habit into their daily routine with the support of their parents/carers.

Challenges maintaining relationships with a wide variety of educational establishments is also identified as a challenge. Participants identified that more work needs to be done to foster positive engagement regularly between the Childsmile teams, nurseries and primary schools – to ensure that staff across all sectors can support children to maintain a healthy mouth.

The final issue identified as a threat to improving children’s oral health relates to the lack of follow-up available to the Childsmile team following dental visits, particularly if the child is not brought to the appointment. Participants highlighted that a lack of communication between general practice and the Childsmile teams can potentially lead to dental decay and patterns of dental neglect not being recognised. Despite following up with schools and health visitors, some participants felt it was the responsibility of the Childsmile team to manage and discuss the need for clearer guidelines around what steps to take in this kind of situation.

Glossary and Abbreviations

- StR: Specialist Trainee Registrar
- QIO: Quality Improvement Officer
- DPA: Dental Practice Advisor
- HSCP: Health and Social Care Partnership
- SIMD: Scottish Index of Multiple Deprivation
- NDIP: National Dental Inspection Programme
- ASG: Associated School Group
- CSN: Community School Network
- DMFT: Decayed Missing/Filled Teeth (obvious decay experience)
- NCD: Non-communicable diseases
- ASN: Additional Support Needs
- UNICEF: United Nations International Children's Emergency Fund
- GDS: General Dental Service
- PDS: Public Dental Service
- HDS: Hospital Dental Service
- SDNAP: Scottish Dental Needs Assessment Programme
- SDCEP: Scottish dental clinical effectiveness programme
- SDR: Scottish Statement Dental Remuneration
- DIAL: Dental Information and Advice Line
- DARC: Dental Advice and Referral Service
- ADI: Aberdeen Dental Institute
- DDH: Dundee Dental Hospital
- GDH: Glasgow Dental Hospital
- EDI: Edinburgh Dental Institute
- MCNs: Managed Clinical Networks
- GA: General Anaesthetic
- DGH: Dr Grays Hospital
- FVAs: Fluoride Varnish Application
- PHS: Public Health Scotland
- WTE: Whole Time Equivalent
- SWOT: Strengths/Weaknesses/Opportunities Threats
- CHW: Child Healthy Weight