HSC Health and Social Care

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Evaluation of the 'Happy Smiles' Oral Health Programme

for Pre-school Children in Northern Ireland



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Report Authors:

Laura Crawford: Specialist Registrar in Dental Public Health, Public Health Agency.

Julie Kelly: Specialist in Paediatric Dentistry/ Dental Adviser, Strategic Planning and Performance Group.

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Queries: DentalServices@health-ni.gov.uk

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Evaluation of the Happy Smiles Oral Health Programme for Pre-school Children in Northern Ireland.

Introduction:

Making Life Better,[1] the current public health strategic framework for Northern Ireland (NI) provides direction for policies and actions to improve the health and wellbeing of our population. This framework is structured around six themes, the first of which is "giving every child the best start in life". One of the most important foundations for building healthy and happy families is the nurturing of children in early life. A child's oral health is recognised as being a contributing factor to their healthy development and it has been seen that if preventative interventions are established at an early stage, children have a higher chance of establishing healthy lifetime habits.

Despite the improvements in disease prevention and dental treatment, tooth decay is still one of the most prevalent diseases affecting children and young people. Oral disease has the potential to produce many symptoms among children that give rise to physical, social, and psychological effects. Poor oral health impacts on both the child and their family.[2]

Dental decay among young children therefore remains an important public health issue due to its impact on quality of life for both children and parents as well as the costs to public services for treatment, especially those relating to hospital admissions for dental extractions under general anaesthetic with the associated health risks and current theatre access challenges post Covid-19 pandemic.

Dental decay is also a preventable disease with considerable existing evidence on potential preventive interventions for children.[3,4] Early decay in the form of enamel only decay can also potentially be treated or halted with appropriate preventive interventions.

Despite this, a recent survey (2021/22) of 5-year old children in NI found a 40.4% overall prevalence of enamel and/or dentinal decay.[5] This is higher than the figure in a comparable recent National Dental Epidemiology Programme survey of 5-year-old children in England 2022[6] in which the overall prevalence of decay experience (enamel and/or dentinal decay) was found to be 29.3%.

Oral disease can diminish a child's quality of life and research shows that children from lower socioeconomic backgrounds and those with physical and mental disabilities tend to have worse oral health outcomes.

Inequalities in the prevalence of dental dentinal decay have been shown to exist in NI with those categorised as 'most deprived' exhibiting greater prevalence of dentinal decay experience (45.2%) compared to those categorised as 'least deprived' (21.8%) in the most recent published survey of 5-year olds.[5]

There are also inequalities in the severity of the dental disease with those categorised as being 'most deprived' (based on the child's home postcode) having a mean $d_3$mft (number of decayed, missing, and/or filled primary teeth) of 1.8 compared with only 0.8 $d_3$mft for those categorised as 'least deprived'.[5]

A recent trial (FiCTION, 2020[7]) has identified that 40 % of young children with dentinal decay will experience toothache and infection. These are the children that are therefore most likely to require hospital admission and extractions under General Anaesthetic (GA).

As with many health problems such as heart disease and obesity, poor oral health is largely determined by a range of modifiable risk factors common to many noncommunicable diseases (NCDs), including sugar consumption, tobacco use, alcohol use and poor hygiene, and their underlying social and commercial determinants. Therefore, providing children and their parents with the appropriate information and skills to develop good oral health habits and a healthy diet in childhood through the provision of an oral health improvement programme may have a positive impact on the reduction of levels of dental disease.

Research shows there is strong evidence that tooth brushing twice daily with the correct level of fluoride toothpaste can help prevent tooth decay.[3] Supervised tooth brushing programmes in nursery settings have been shown to be associated with a decrease in dental decay, improvement in child dental health as well as reducing oral health inequalities.[7]

Background to the Development of the *Happy Smiles Oral Health Programme*:

The "Investing for Health Strategy" (DHSPSS, 2002)[8] was developed during the time of the New Northern Ireland Assembly and represented the first cross-departmental health strategy in NI. The "Programme for Government" at this time recognised that a successful society must include health improvements and act to tackle the factors which adversely affect health and perpetuate the health inequalities that existed in the NI population.

Investing for Health funding was initially used by the Department of Health, Social Security and Personal Services (DHSSPS) for Health and Social Care (HSC) Trusts to individually trial a number of caries preventive oral health programmes. Funding became recurrent in 2008 and an evaluation of the programmes delivered by the Trusts was undertaken.

Whilst it was not feasible to differentiate Trust programmes on the basis of health outcomes, some schemes appeared to operate in a more streamlined manner/ easier to deliver than others. A Regional NI Oral Health Improvement Group with representation from DHSPSS, Health and Social Care Boards (HSCB) and HSC Trusts was subsequently convened to ensure that best practice was shared among those operationally involved in these schemes.

The regional *Happy Smiles Oral Health Programme*[9,10] for pre-school children was then developed by the NI Oral Health Improvement Group in collaboration with HSC Trust Community Dental Service teams. This evidence-based programme was launched regionally in 2016, and it brought together examples of best practice from previous programmes/ initiatives in keeping with the recommendation in the "Bengoa Report" (2016)[11] that in NI, commissioners and providers should "scale up areas of good practice".

This programme was innovative as it provided the first regional approach across HSC Trust boundaries/ the NI population working collaboratively with pre-school education providers who would deliver the programme following initial training by the HSC Trust Oral Health Teams. This therefore encouraged a shared responsibility and collaborative working between schools, parents, children and oral health professionals.

Such working was in keeping with relevant regional strategies and reviews including the Bengoa Report: Systems, Not Structures, (2016)[11] and with current regional health strategies that recognise that the health of the population is the responsibility of more than just health providers (Health and Wellbeing 2026: Delivering Together, 2016; the Integrated Care Systems NI (ICSNI)).[12]

The *Happy Smiles Oral Health Programme*:

Launched in October 2016,[9] the *Happy Smiles Oral Health Programme*[10] in funded pre-school education facilities (facilities are education authority funded pre-school facilities for children in the year before they start primary school. Children are age 3 or 4 when they commence pre-school education.) can support the work already being carried out in the home to help achieve improved child oral health and reduce oral health inequalities. This evidence-based programme aims to encourage regular brushing with fluoride toothpaste, healthy eating and registration with a general dental practitioner to improve the oral health of children in pre-school education and reduce levels of dental decay. The initiative encourages shared responsibility and collaborative effort between schools, parents and their children. It enables staff in pre-school facilities to deliver the programme following initial training by their local Oral Health Team.

The programme has three main elements:

1. Happy Smiles Supervised Tooth Brushing Programme

   The tooth brushing programme consists of supervised tooth brushing within the pre-school facility, where parental/guardian permission is sought to participate. The Community Dental Service or the Oral Health Improvement Team in each Trust area provides the pre-school staff with training in toothbrushing techniques and infection control, with a pre-school identifying a designated leader to oversee the programme.

2. Happy Smiles Healthy Snacks

   The healthy snacks component of the programme promotes healthy snacks in pre-school facilities on a daily basis to reduce the frequency of sugar intake and increase access to fruit. There should be a written break time food policy which forms part of overall school health policy and is implemented in partnership with parents/guardians.

3. Happy Smiles Education Programme

   The educational component of the programme focuses on educating children on the main causes of tooth decay and how it can be prevented. Children will be aware that they should brush their teeth twice a day with fluoride toothpaste, especially last thing at night, all snacks between meals should be healthy and low in sugar or sugar free, milk and water are the recommended drinks between meals to help prevent tooth decay. They will be aware that they should visit their dentist for regular check-ups.

Funding for the *Happy Smiles Oral Health Programme* is targeted at the funded pre-school education facilities in the 20% most deprived wards in each Health and Social Care Trust in Northern Ireland, this targeted approach should lead to a reduction in the recognised dental health inequalities across the child population.

Programme resources including standardised protocols, consent forms and information leaflets were developed at a regional level and have been updated as required.

Evaluation Need

Although the *Happy Smiles* programme documentation includes resources for monitoring/ evaluating the programme at Trust level through the collation of feedback from pre-school staff, a regional evaluation has not been undertaken to assess the effectiveness of the intervention and review programme co-ordination and delivery.

There have also been limited opportunities for regional learning and sharing of any related resources that have been developed by individual Trusts in the interim for delivering the programme or for training participants and new HSC Trust staff.

In 2023, the Department of Health published the *Northern Ireland Children's Oral Health Improvement Plan.*[13] This plan had the following aims:

- To reduce the prevalence and severity of dental caries (decay) in children
- To reduce oral health inequalities by targeting children at higher risk of developing dental disease
- To support the current strategic basis upon which preventative programmes and children's oral health services can be developed in Northern Ireland, subject to robust business case development
- To reduce the number of children requiring dental extractions under general anaesthetic (GA) due to dental caries.

This plan also detailed recommendations to achieve these aims, several of which were relevant to preventative oral health programmes in children and specifically the *Happy Smiles* programme. These included:

- Preventative initiatives should be supported by a strong evidence base
- Targeted evidence-based programmes should be aimed at those at high risk of dental disease
- Consideration should also be given to the cost-effectiveness of any interventions

- Re-launch of Happy Smiles Programme

- Expansion of the Happy Smiles Programme to all Primary 1 and Primary 2 children in Northern Ireland.

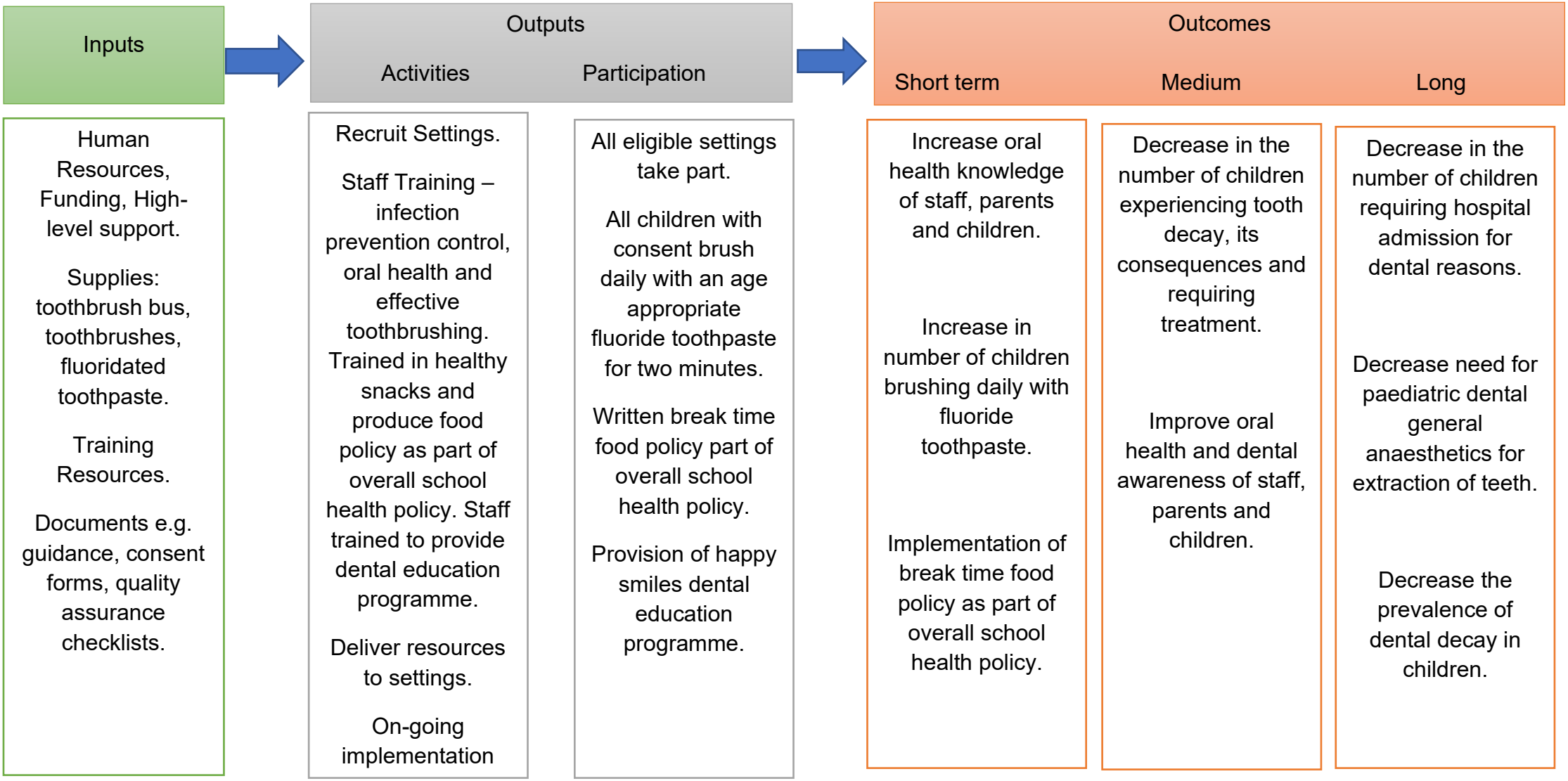
- Design and Implement age appropriate, evidence based oral health improvement programmes for Primary School-age children in Northern Ireland.

A subsequent Consultation Report (DOH, 2024) [13] detailed universal support for these recommendations and also included the recommendation that preventive interventions should be standardised and incorporated regionally with the aim to reduce the need for referral for dental extractions under General Anaesthetic (GA) for all children. Referral levels and waiting lists for Paediatric Dental GAs are significant in NI and were severely impacted by the Covid-19 pandemic and the subsequent reduction in access to theatres.

This evaluation is therefore timely and necessary for the planning of any potential expansion of the current *Happy Smiles* programme, as well as providing learning for the potential development of similar age appropriate school-based programmes for other age groups of children and in the longer term reducing the demand for GA services across the region. The evaluation findings will also be essential to support the development of any investment proposals for funding such programmes/ expansion.

Logic Model: *Happy Smiles Oral Health Programme*

Goals - Establish optimal oral health habits for life. Improve quality of life of young children and their families.



Evaluation Design

Evaluation Objectives

The evaluation will seek to answer the questions as outlined in Table 1.

Table 1: Evaluation Objectives

Objective	Sources of Evidence
Were the *Happy Smiles Oral Health Programme* activities delivered as intended?	Quantitative data on coverage and uptake of • Happy Smiles Tooth Brushing Programme • Happy Smiles Healthy Snacks • Happy Smiles Education Programme
Were the short and medium outcomes achieved?	Surveys and semi-structured interviews with Community Dental Service staff. Surveys of pre-school facilities currently taking part in the *Happy Smiles Oral Health Programme.*
What key learning and insights about *Happy Smiles Oral Health Programme* implementation have been gained?	Surveys and semi-structured interviews with Community Dental Service staff. Surveys of pre-school facilities currently taking part in the *Happy Smiles Oral Health Programme.*
Were long term outcomes achieved?	National oral health surveys of five-year-olds (e.g., dmft – decayed, missing, filled teeth) General Dental Services Statistics • Registrations • Extractions • Fillings General Anaesthetic Statistics

Coverage and Participation

- Number of facilities providing funded pre-school education in Northern Ireland.
- Number of facilities providing funded pre-school education in Northern Ireland who are eligible for targeted participation in *Happy Smiles Oral Health Programme*.
- Number and proportion of facilities providing funded pre-school education in Northern Ireland who are eligible for targeted participation and participate in *Happy Smiles Oral Health Programme*.
- Number of facilities providing funded pre-school education in each of the five Health and Social Care Trusts in Northern Ireland.
- Number of facilities providing funded pre-school education in each of the five Health and Social Care Trusts in Northern Ireland who are eligible for targeted participation in *Happy Smiles Oral Health Programme*.
- Narrative report of efforts made to engage target settings that have declined to participate.

Key Performance Indicators

- Number and proportion of facilities providing funded pre-school education in each of the five Health and Social Care Trusts in Northern Ireland who are eligible for targeted participation and participate in the *Happy Smiles Oral Health Programme*.
- Acceptability of the scheme to both facility staff and HSC Trust stakeholders.

Reflections

- Note any challenges or feedback and efforts made to address these.

Data Sources

- Health and Social Care (HSC) Trust stakeholder evaluation questionnaire of the five Health and Social Care Trusts in Northern Ireland: Belfast HSC Trust, Northern HSC Trust, South Eastern HSC Trust, Southern HSC Trust, Western HSC Trust.
- Semi-structured interviews with HSC representatives delivering the *Happy Smiles Oral Health Programme* in each of the HSC Trusts*.

- Microsoft Forms questionnaire for stakeholders at each of the pre-school facilities currently participating in the *Happy Smiles Oral Health Programme*
- National oral health surveys of five-year-olds[5,6]
- General Dental Services Statistics[14]
- Community Dental Services General Anaesthetic Statistics

Methodology

Process and outcome (participation rates) evaluations were undertaken. The evaluation involved a mixed methods approach, integrating both quantitative and qualitative datasets.

The use of triangulation has been proposed as a means of achieving validity in evaluation[15] and is particularly relevant to the toothbrushing in schools' scheme. This approach relies on collecting evidence of impact from a variety of different sources and making conclusions based on the overall data collected.

The evaluation follows both the evaluation guidance *Planning an evaluation: evaluation in health and wellbeing*[16] published by the Office for Health Improvement and Disparities (August 2018) as well as an adapted version of evaluation guidance for supervised toothbrushing schemes published by *BRUSH* (optimising *toothBrushing pRogrammes in nUrseries and ScHools*).[17] This guidance was adapted to the Northern Ireland context with not only evaluation of the supervised toothbrushing element, but also with the addition of evaluation of the healthy snacks and education elements of the regional *Happy Smiles Oral Health Programme*.

A number of approaches were used to collect data. These included an online evaluation questionnaire, distributed via Microsoft Forms to each of the five HSC Trusts in NI; responses were reviewed by members of the evaluation team to identify themes and areas requiring further exploration or clarity.

Subsequent semi structured interviews with HSC representatives and members of the evaluation team provided further data. Variation existed between the HSC Trusts regarding the professionals involved in these interviews, however across the region representatives from all relevant professions including oral health promotion staff, dental therapists, dental health educators, community dentists and service management had the opportunity to contribute.

A second online questionnaire for stakeholders at each of the participating educational facilities was distributed by Microsoft Forms. This was facilitated by the *Happy Smiles* team in each HSC Trust distributing the link to facilities within their Trust location. The questionnaire consisted of both closed and open-ended questions covering all aspects of the delivery of the *Happy Smiles Oral Health Programme* including any difficulties/ barriers as well as ideas for improvement.

A further approach to data collection and analysis included identification of facilities providing funded pre-school education in the 20% most deprived wards in each Health and Social Care Trust in NI. A desktop exercise was completed to compare the facilities currently participating in the *Happy Smiles Oral Health Programme* to those who fall within the target of facilities providing funded pre-school education in the 20% most deprived wards in each Health and Social Care Trust in NI.

Further analysis on pre-school facilities was completed, including identification of facilities providing funded pre-school education in the 20% most deprived wards in each Health and Social Care Trust, identification of facilities providing funded pre-school education in the 20% most deprived wards at a Northern Ireland level, and comparison of facilities that would be eligible for targeted participation in *Happy Smiles Oral Health Programme* when each methodology is applied (20% most deprived wards HSCT Level compared to 20% most deprived wards NI Level).

A number of approaches for data analysis were also used to report on the oral health outcomes of *Happy Smiles Oral Health Programme.* General Dental Services data[14] was analysed to report on any trends in fillings and extractions completed following the implementation of *Happy Smiles Oral Health Programme.* Data on general anaesthetics for dental extractions provided by the community dental service in Northern Ireland were also reviewed and included in the evaluation to assess if introduction of *Happy Smiles Oral Health Programme* had any impact on general anaesthetics for children for dental extractions. Finally, oral health survey data from the five-year-old oral health survey[5] was analysed to report on any changes in the oral health of five-year olds that may be attributable to the introduction of the *Happy Smiles Oral Health Programme.*

There are limitations to the approaches used to analyse the oral health outcomes associated with Happy Smiles Programme, when the scheme was set up a control group of children was not created to allow comparison of those receiving the intervention with a similar group of children who did not receive the intervention making it difficult to draw conclusions from the data sets. There are also many potential factors affecting the outcome variables, these outcome variables are proxy measures and were not intended to be used to indicate improvements in oral health as a result of the Programme. Similarly, other factors such as the soft drinks industry levy and access to dental services will impact on the data within this report.

Results

Analysis of Facilities participating in *Happy Smiles Oral Health Programme*

Terminology Used for Analysis of Facilities participating in *Happy Smiles Oral Health Programme*

Ward- Electoral wards are the spatial units used to elect local government councillors in Local Government Districts in Northern Ireland. There are 462 Electoral Wards (Wards2014) in Northern Ireland.[18]

Deprivation- Wards are ranked from the most deprived (rank 1) to the least deprived (rank 462). Rankings are available for each of 7 distinct types (domains) of deprivation, which have been combined to produce an overall multiple deprivation measure (MDM) rank. The MDM rank is the ranking used within this analysis.[19]

Number of Facilities – Number of facilities providing funded pre-school education.

Number of Facilities Participating – Number of facilities participating in the *Happy Smiles Oral Health Programme*.

Number of Target Facilities - Number of facilities providing funded pre-school education that fall within the target catchment area of the 20% most deprived wards in each Health and Social Care Trust.

Number of Target Facilities Participating - Number of facilities providing funded pre-school education that fall within the targeted catchment area of the 20% most deprived wards in each Health and Social Care Trust AND participate in the *Happy Smiles Oral Health Programme*.

Number of Non-Target Facilities Participating - Number of facilities providing funded pre-school education that do not fall within the targeted catchment area of the 20% most deprived wards in each Health and Social Care Trust or are not a facility providing funded pre-school education AND participate in the *Happy Smiles Oral Health Programme*.

Number of Target Facilities Not Participating - Number of facilities providing funded pre-school education that fall within the targeted catchment area of the 20% most deprived wards in each Health and Social Care Trust AND DO NOT participate in the *Happy Smiles Oral Health Programme*.

Data Collection

A list of the Electoral Ward (Ward2014) level Domain Measures of Deprivation was obtained from Northern Ireland Statistics and Research Agency (NISRA)[20] A desktop exercise was completed to assign each Electoral Ward in Northern Ireland to the correct location within each of the five HSC Trust geographical boundaries in NI, using the NISRA Boundary Application[21] provided by Ordinance Survey of Northern Ireland. A further desktop exercise was undertaken to identify the 20% most deprived wards in each HSC Trust in NI.

A list of facilities providing funded pre-school education in NI was obtained from the Department of Education website.[22] This was analysed and filtered to provide a summary of facilities providing funded pre-school education in each of the five HSC Trust areas. A desktop exercise was completed to identify facilities that fall within the targeted 20% most deprived wards in each HSC Trust in NI.

Analysis was undertaken to compare the facilities currently participating in the *Happy Smiles Oral Health Programme* to those who fall within the target of facilities providing funded pre-school education in the 20% most deprived wards in each HSC Trust in NI. This analysis is a snap shot of facility participation for the academic year 2023-2024.

Wards

There are 462 electoral wards in Northern Ireland. There are different numbers of wards in each Health and Social Care Trust (HSCT), summarised in Table 2. The methodology of 20% most deprived wards in each HSCT was applied to identify the number of wards eligible in each HSC Trust to participate in the *Happy Smiles Oral Health Programme.* Lists of eligible wards in each HSCT can be found in Appendix A.

Table 2: Wards in each Health and Social Care Trust (HSCT)

HSCT	Number of Wards	Number of Wards in 20%	Number of Wards Selected
BHSCT	69	13.8	14
NHSCT	134	26.8	27
SEHSCT	89	17.8	18
SHSCT	80	16	16
WHSCT	90	18	18
Total	462	92.4	93

Data Analysis

Northern Ireland Level Analysis

Northern Ireland Summary of Facilities

Tables 3 and 4 and Figure 1 provide a summary of the number of facilities, number of facilities participating, number of target facilities, number of target facilities participating, number of non-target facilities participating and number of target facilities not participating in the *Happy Smiles Oral Health Programme* for the academic year 2023-2024. A detailed summary and description of participation in each Health and Social Care Trust can be found on pages 23-32.

The *Happy Smiles Oral Health Programme* has a targeted approach for the funded pre-school education facilities in the 20% most deprived wards in each Health and Social Care Trust.

Table 3: Northern Ireland Summary of Target Facility Participation

	BHSCT	NHSCT	SEHSCT	SHSCT	WHSCT	NI Total
Number of Funded Pre-School Facilities	112	178	135	172	138	**735**
Number of Target Facilities	34	41	39	44	32	**190**
Number of Target Facilities Participating	33	8	7	20	29	**97**
Percentage of Target Facilities Participating	97%	20%	18%	45%	91%	**51%**
Number of Target Facilities Not Participating	1	33	32	24	3	**93**
Percentage of Target Facilities Not Participating	3%	80%	82%	55%	9%	**49%**

Table 4: Northern Ireland Summary of Facility Participation (Target and Non-target)

	BHSCT	NHSCT	SEHSCT	SHSCT	WHSCT	NI Total
Number of Facilities Participating (target + non-target)	73	16	19	82	138	**328**
Number of Target Facilities Participating	33	8	7	20	29	**97**
Percentage of Participating Facilities That are Target Facilities	45%	50%	37%	24%	21%	**30%**
Number of Non-Target Facilities Participating	40	8	12	62	109	**231**
Percentage of Participating Facilities That are Non-target Facilities	55%	50%	63%	76%	79%	**70%**

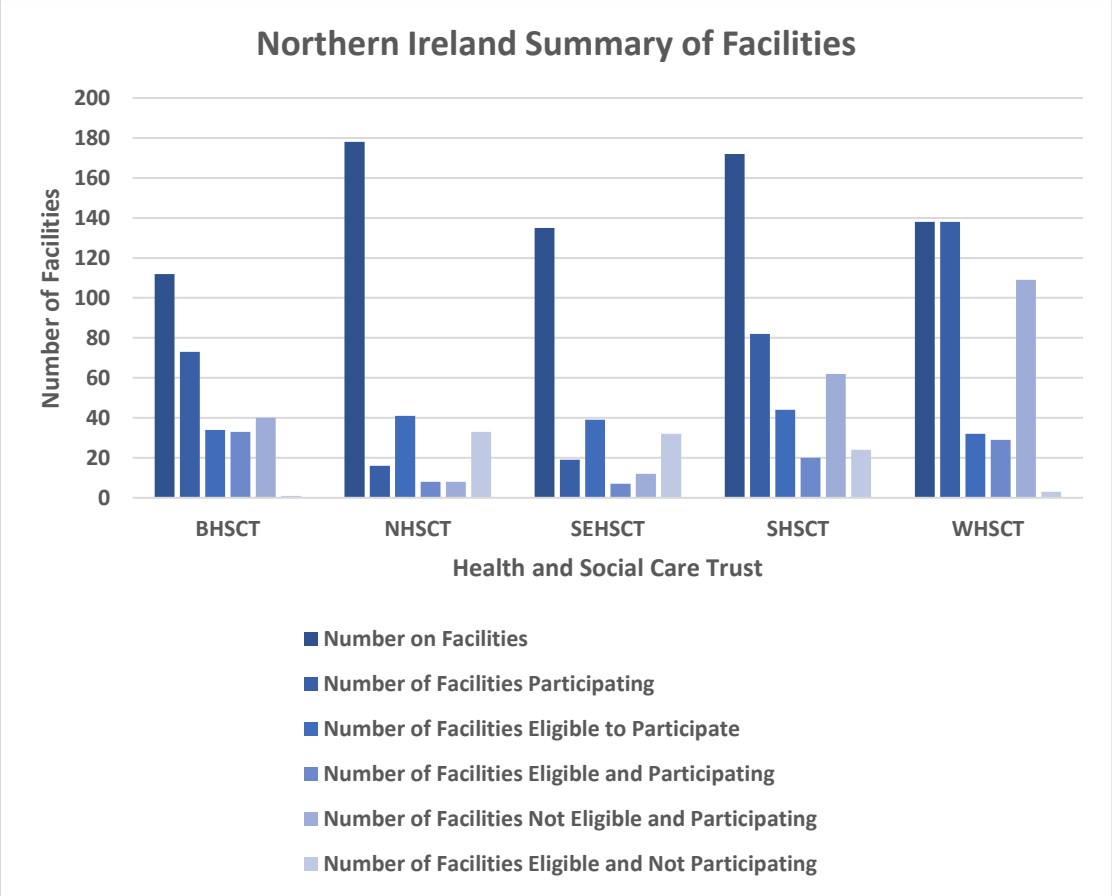


Figure 1: Northern Ireland Summary of Facilities

Happy Smiles Facility Participation Northern Ireland Level Analysis

As of June 2024, there are 735 facilities in Northern Ireland providing funded pre-school education[23] using the eligibility criterion of 20% most deprived wards in each HSCT area in Northern Ireland, 190 of the 735 facilities are target facilities for participation in the *Happy Smiles Oral Health Programme* (26%).

Proportion of Participating Facilities Who Are Target Facilities Northern Ireland Level Analysis

There are 328 facilities in Northern Ireland participating in the *Happy Smiles Oral Health Programme*, 97 of the 328 participating facilities are target facilities (30%) whilst 231 of the 328 participating facilities are non-target facilities (70%).

Non-target facilities participating in the *Happy Smiles Oral Health Programme* are either not within 20% most deprived wards in each HSCT (169 facilities, 73%) or are not facilities providing funded pre-school education (62 facilities, 27%).

This indicates that the targeted approach for the pre-school facilities in the 20% most deprived wards in each Health and Social Care Trust in Northern Ireland has not been applied.

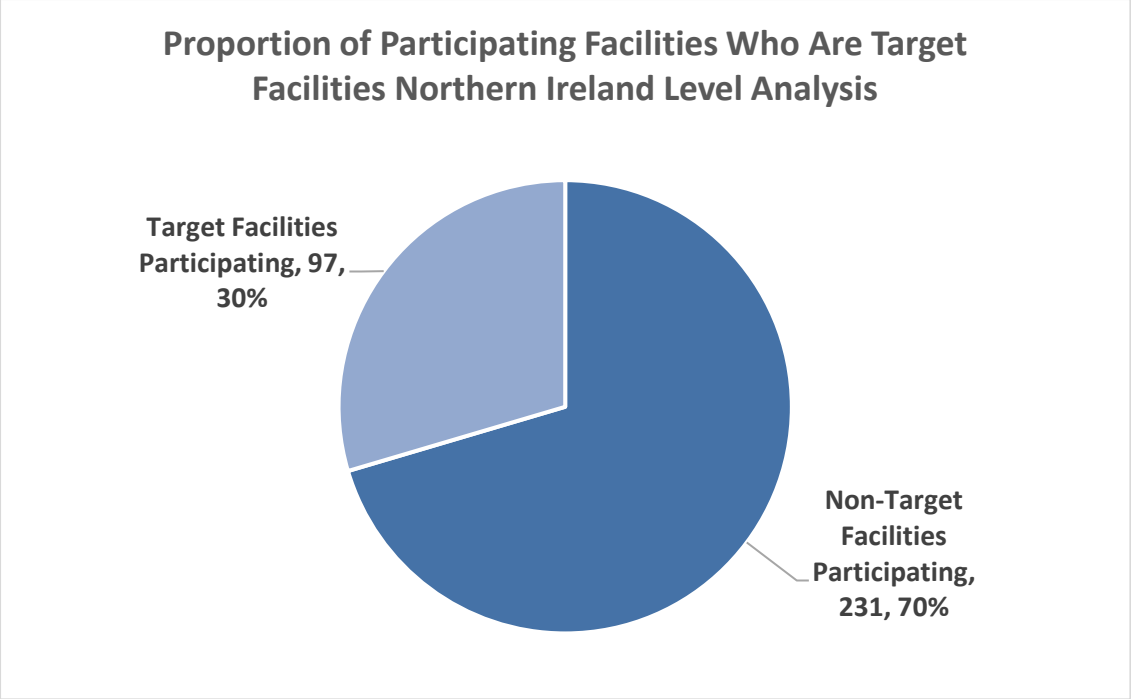


Figure 2: Proportion of Participating Facilities Who Are Target Facilities Northern Ireland Level Analysis

Proportion of Target Facilities Who Participate Northern Ireland Level Analysis

There are 190 target facilities in Northern Ireland. 97 target facilities participate in the *Happy Smiles Oral Health Programme* (51%) whilst 93 target facilities do not participate in the *Happy Smiles Oral Health Programme* (49%). It is estimated that within the target facilities there are over 3000 children participating in the programme.

There are a number of possible explanations for the low levels of participation from target facilities, including:

- The targeted approach for the pre-school facilities in the 20% most deprived wards in each Health and Social Care Trust has not been applied therefore the target facilities may not have been identified and offered to participate in the *Programme.*
- There may be greater barriers to participation in the *Happy Smiles Oral Health Programme* for schools located in deprived areas.
- Those who are in the targeted area may have been invited to participate but have declined participation.

Barriers and facilitators to participation in the *Happy Smiles Oral Health Programme* are explored further in the questionnaires and semi-structured interviews with community dental service teams and questionnaires from pre-school facilities participating in the *Happy Smiles Oral Health Programme.*



Figure 3: Proportion of Target Facilities Who Participate Northern Ireland Level Analysis

Health and Social Care Trust Level Analysis

Belfast Health and Social Care Trust (BHSCT)

Happy Smiles Facility Participation Belfast Health and Social Care Trust Level Analysis

There are 112 facilities across the BHSCT area providing funded pre-school education, using the eligibility criterion of 20% most deprived wards in BHSCT area, 34 of the 112 facilities are target facilities for participation in the *Happy Smiles Oral Health Programme* (30%).

Table 5: Happy Smiles Facility Participation Belfast Health and Social Care Trust Level Analysis

	BHSCT
Number of Funded Pre-School Facilities	112
Number of Facilities Participating (Target + Non-target)	73
Number of Target Funded Pre-School Facilities	34
Number of Target Facilities Participating	33
Number of Non-Target Facilities Participating	40
Number of Target Facilities Not Participating	1

Proportion of Participating Facilities Who Are Target Facilities Belfast Health and Social Care Trust Level Analysis

There are 73 facilities in BHSCT participating in the *Happy Smiles Oral Health Programme*, 33 of the 73 participating facilities are target facilities (45%) whilst 40 of the 73 participating facilities are non-target facilities (55%).

Non-target facilities participating in the *Happy Smiles Oral Health Programme* are either not within 20% most deprived wards in BHSCT (36 facilities, 90%) or are not facilities providing funded pre-school education (4 facilities, 10%).

This indicates that the targeted approach for the pre-school facilities in the 20% most deprived wards in Belfast Health and Social Care Trust has not been applied.

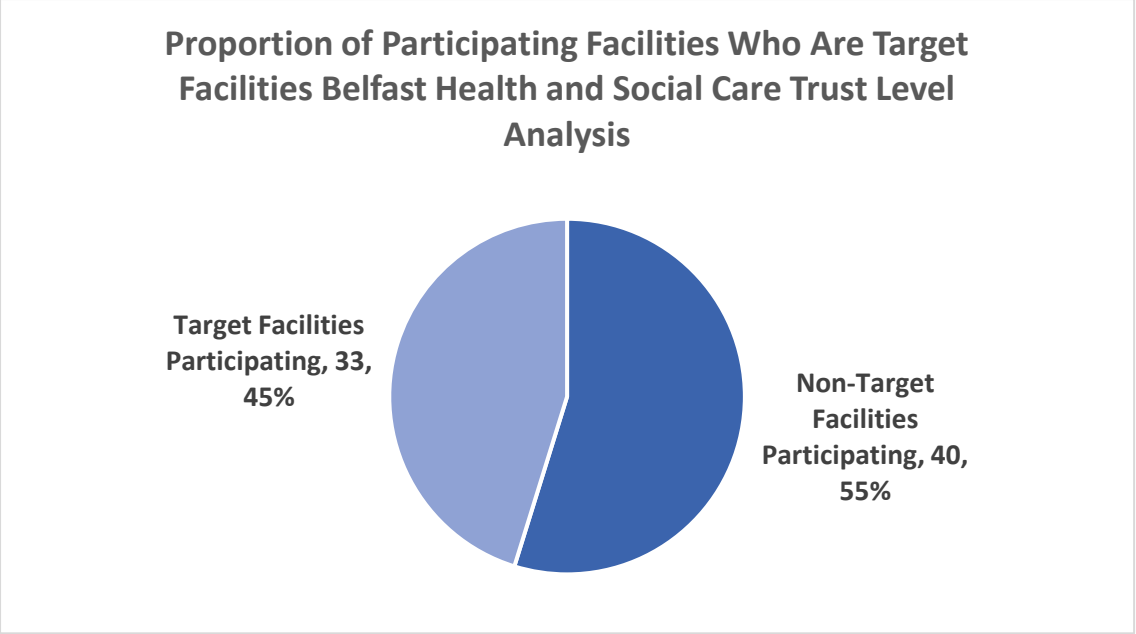


Figure 4: Proportion of Participating Facilities Who Are Target Facilities Belfast Health and Social Care Trust Level Analysis

Proportion of Target Facilities Who Participate Belfast Health and Social Care Trust Level Analysis

There are 34 target facilities in BHSCT, 33 target facilities participate in the *Happy Smiles Oral Health Programme* (97%) whilst 1 target facility does not participate in the *Happy Smiles Oral Health Programme* (3%).

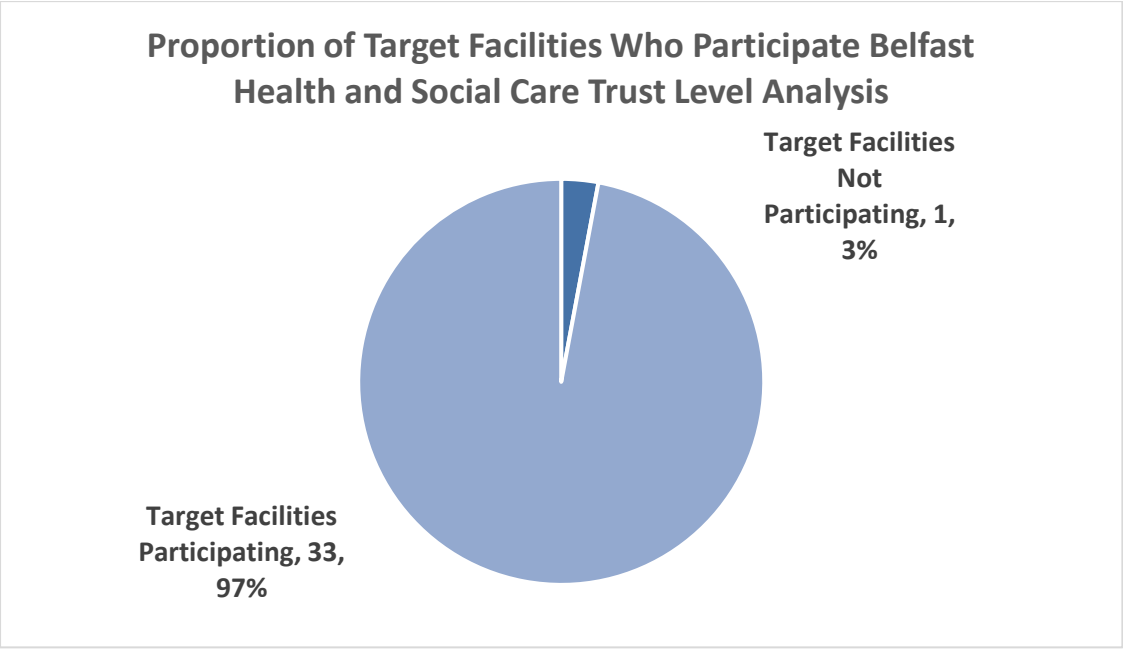


Figure 5: Proportion of Target Facilities Who Participate Belfast Health and Social Care Trust Level Analysis

Northern Health and Social Care Trust (NHSCT)

Happy Smiles Facility Participation Northern Health and Social Care Trust Level Analysis

There are 178 facilities across the NHSCT area providing funded pre-school education, using the eligibility criterion of 20% most deprived wards in NHSCT area, 41 of the 178 facilities are target facilities for participation in the *Happy Smiles Oral Health Programme* (23%).

Table 6: Happy Smiles Facility Participation Northern Health and Social Care Trust Level Analysis

	NHSCT
Number of Funded Pre-School Facilities	178
Number of Facilities Participating (Target + Non-target)	16
Number of Target Funded Pre-School Facilities	41
Number of Target Facilities Participating	8
Number of Non-Target Facilities Participating	8
Number of Target Facilities Not Participating	33

Proportion of Participating Facilities Who Are Target Facilities Northern Health and Social Care Trust Level Analysis

There are 16 facilities in NHSCT participating in the *Happy Smiles Oral Health Programme*, 8 of the 16 participating facilities are target facilities (50%) whilst 8 of the 16 participating facilities are non-target facilities (50%).

Non-target facilities participating in the *Happy Smiles Oral Health Programme* are either not within 20% most deprived wards in NHSCT (7 facilities, 88%) or are not facilities providing funded pre-school education (1 facility, 12%).

This indicates that the targeted approach for the pre-school facilities in the 20% most deprived wards in Northern Health and Social Care Trust has not been applied.

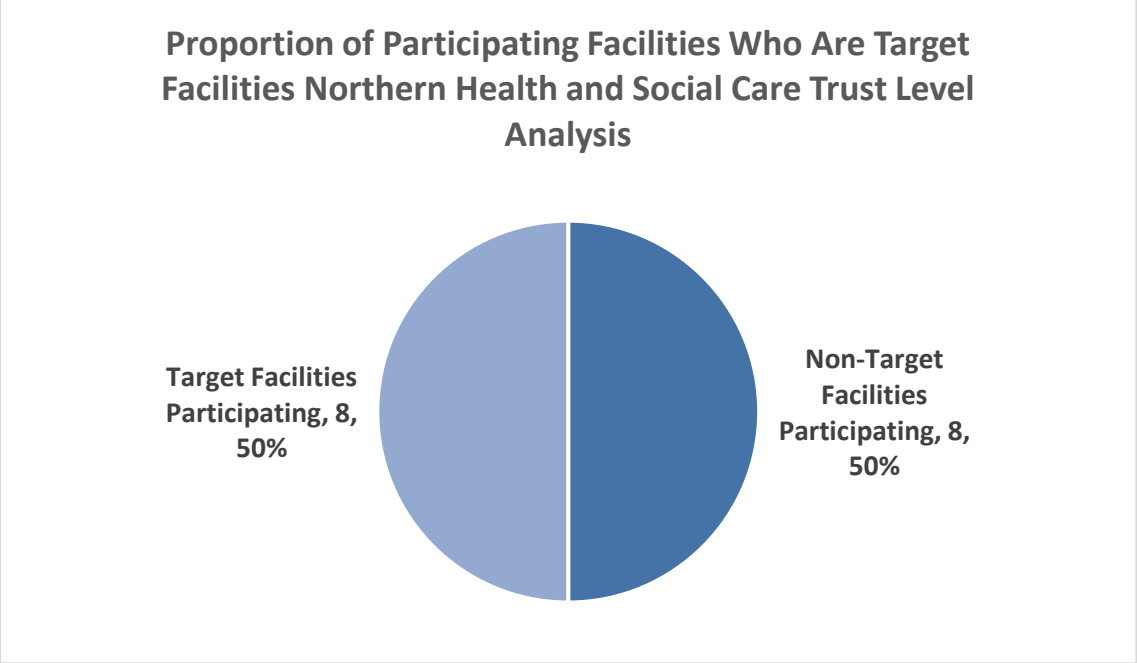


Figure 6: Proportion of Participating Facilities Who Are Target Facilities Northern Health and Social Care Trust Level Analysis

Proportion of Target Facilities Who Participate Northern Health and Social Care Trust Level Analysis

There are 41 target facilities in NHSCT, 8 target facilities participate in the *Happy Smiles Oral Health Programme* (20%) whilst 33 target facilities do not participate in the *Happy Smiles Oral Health Programme* (80%).

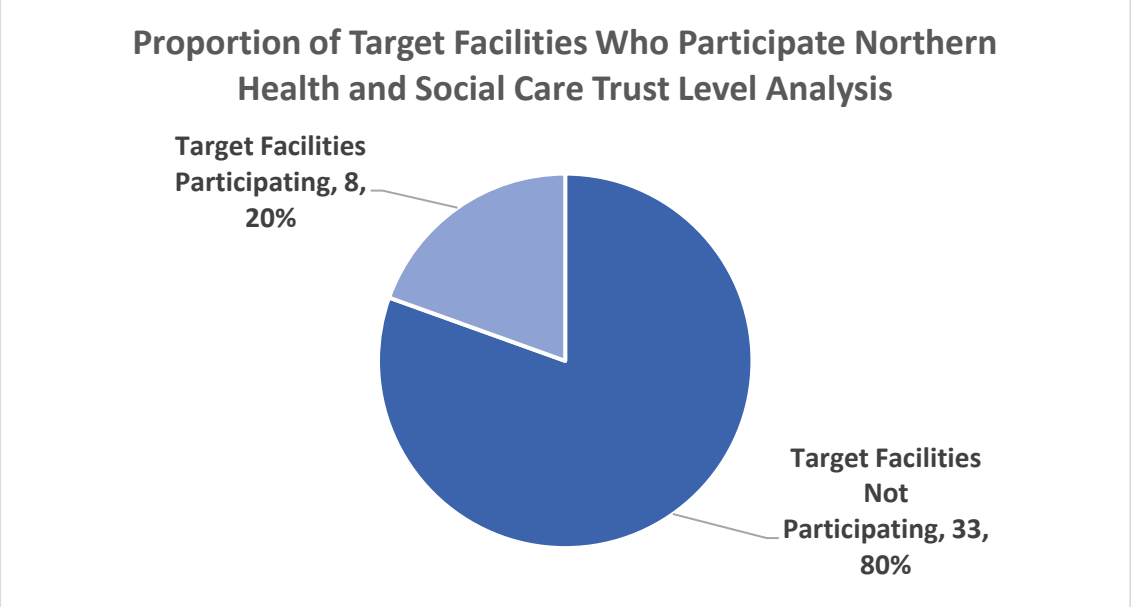


Figure 7: Proportion of Target Facilities Who Participate Northern Health and Social Care Trust Level Analysis

South Eastern Health and Social Care Trust (SEHSCT)

Happy Smiles Facility Participation South Eastern Health and Social Care Trust Level Analysis

There are 135 facilities across the SEHSCT area providing funded pre-school education, using the eligibility criterion of 20% most deprived wards in SEHSCT area, 39 of the 135 facilities are target facilities for participation in the *Happy Smiles Oral Health Programme* (27%).

Table 7: Happy Smiles Facility Participation South Eastern Health and Social Care Trust Level Analysis

	SEHSCT
Number of Funded Pre-School Facilities	135
Number of Facilities Participating (Target + Non-target)	19
Number of Target Funded Pre-School Facilities	39
Number of Target Facilities Participating	7
Number of Non-Target Facilities Participating	12
Number of Target Facilities Not Participating	32

Proportion of Participating Facilities Who Are Target Facilities South Eastern Health and Social Care Trust Level Analysis

There are 19 facilities in SEHSCT participating in the *Happy Smiles Oral Health Programme*, 7 of the 19 participating facilities are target facilities (37%) whilst 12 of the 19 participating facilities are non-target facilities (63%).

Non-target facilities participating in the *Happy Smiles Oral Health Programme* are either not within 20% most deprived wards in SEHSCT (7 facilities, 58%) or are not facilities providing funded pre-school education (5 facilities, 42%).

This indicates that the targeted approach for the pre-school facilities in the 20% most deprived wards in South Eastern Health and Social Care Trust has not been applied.

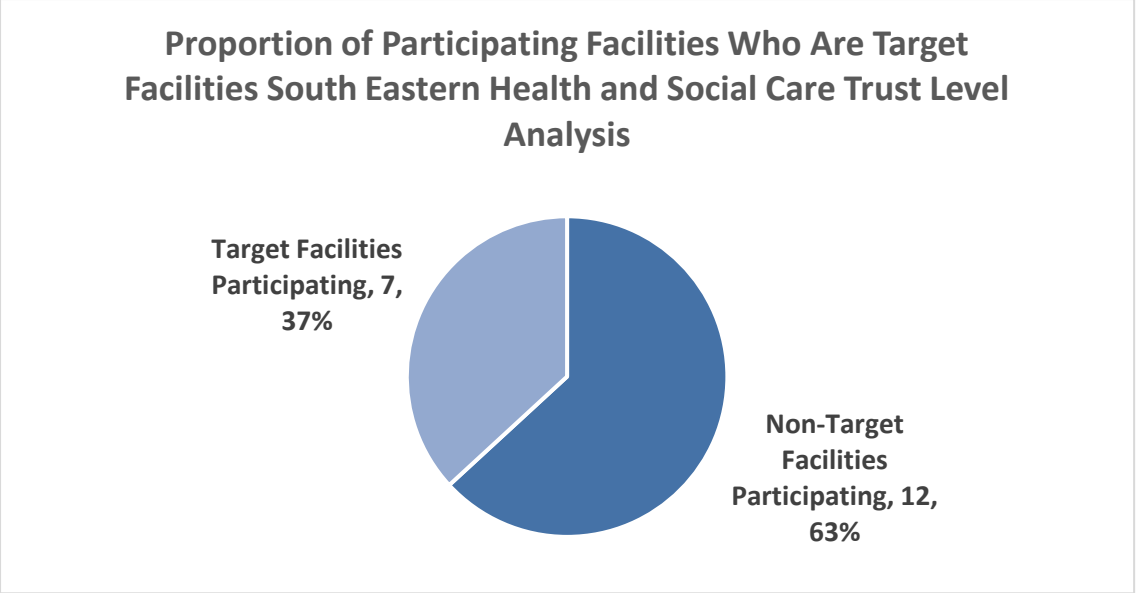


Figure 8: Proportion of Participating Facilities Who Are Target Facilities South Eastern Health and Social Care Trust Level Analysis

Proportion of Target Facilities Who Participate South Eastern Health and Social Care Trust Level Analysis

There are 39 target facilities in SEHSCT, 7 target facilities participate in the *Happy Smiles Oral Health Programme* (18%) whilst 32 target facilities do not participate in the *Happy Smiles Oral Health Programme* (82%).

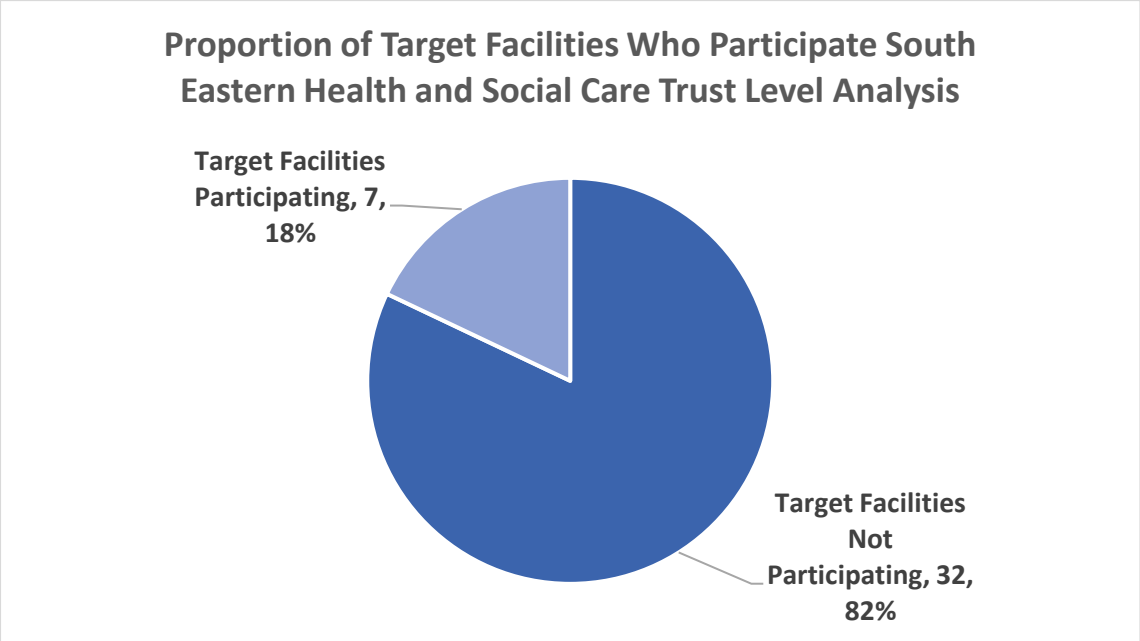


Figure 9: Proportion of Target Facilities Who Participate South Eastern Health and Social Care Trust Level Analysis

Southern Health and Social Care Trust (SHSCT)

Happy Smiles Facility Participation Southern Health and Social Care Trust Level Analysis

There are 172 facilities across the SHSCT area providing funded pre-school education, using the eligibility criterion of 20% most deprived wards in SHSCT area, 44 of the 172 facilities are target facilities for participation in the *Happy Smiles Oral Health Programme* (26%).

Table 8: Happy Smiles Facility Participation Southern Health and Social Care Trust Level Analysis

	SHSCT
Number of Funded Pre-School Facilities	172
Number of Facilities Participating (Target + Non-target)	82
Number of Target Funded Pre-School Facilities	44
Number of Target Facilities Participating	20
Number of Non-Target Facilities Participating	62
Number of Target Facilities Not Participating	24

Proportion of Participating Facilities Who Are Target Facilities Southern Health and Social Care Trust Level Analysis

There are 82 facilities in SHSCT participating in the *Happy Smiles Oral Health Programme*, 20 of the 82 participating facilities are target facilities (24%) whilst 62 of the 82 participating facilities are non-target facilities (76%).

Non-target facilities participating in the *Happy Smiles Oral Health Programme* are either not within 20% most deprived wards in SHSCT (32 facilities, 52%) or are not facilities providing funded pre-school education (30 facilities, 48%).

This indicates that the targeted approach for the pre-school facilities in the 20% most deprived wards in Southern Health and Social Care Trust has not been applied.

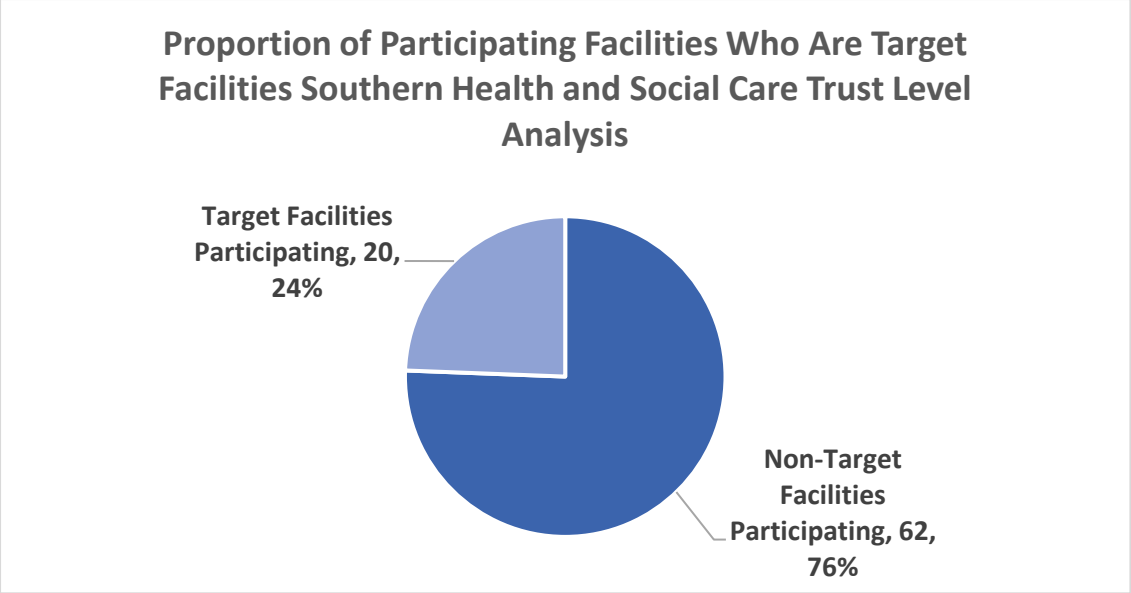


Figure 10: Proportion of Participating Facilities Who Target Facilities Southern Health and Social Care Trust Level Analysis

Proportion of Target Facilities Who Participate Southern Health and Social Care Trust Level Analysis

There are 44 target facilities in SHSCT, 20 target facilities participate in the *Happy Smiles Oral Health Programme* (45%) whilst 24 target facilities do not participate in the *Happy Smiles Oral Health Programme* (55%).

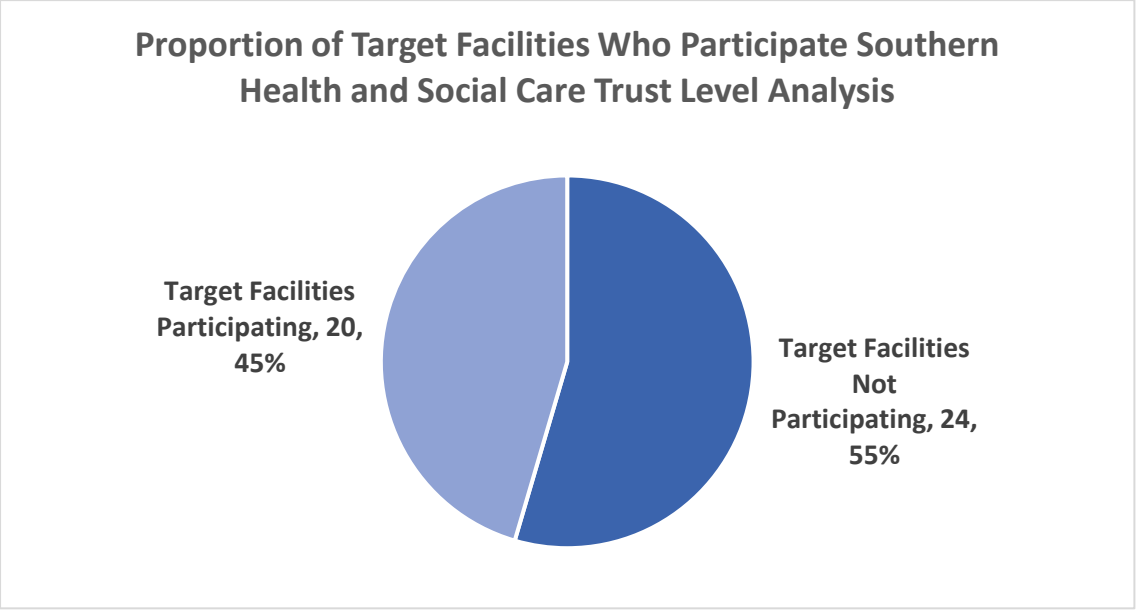


Figure 11: Proportion of Target Facilities Who Participate Southern Health and Social Care Trust Level Analysis

Western Health and Social Care Trust (WHSCT)

Happy Smiles Facility Participation Western Health and Social Care Trust Level Analysis

There are 138 facilities across the WHSCT area providing funded pre-school education, using the eligibility criterion of 20% most deprived wards in WHSCT area, 32 of the 138 facilities are target facilities for participation in the *Happy Smiles Oral Health Programme* (23%).

Table 9: Happy Smiles Facility Participation Western Health and Social Care Trust Level Analysis

	WHSCT
Number of Funded Pre-School Facilities	138
Number of Facilities Participating (Target + Non-target)	138
Number of Target Funded Pre-School Facilities	32
Number of Target Facilities Participating	29
Number of Non-Target Facilities Participating	109
Number of Target Facilities Not Participating	3

Proportion of Participating Facilities Who Are Target Facilities Western Health and Social Care Trust Level Analysis

There are 138 facilities in WHSCT participating in the *Happy Smiles Oral Health Programme*, 29 of the 138 participating facilities are target facilities (21%) whilst 109 of the 138 participating facilities are non-target facilities (79%).

Non-target facilities participating in the *Happy Smiles Oral Health Programme* are either not within 20% most deprived wards in WHSCT (87 facilities, 80%) or are not facilities providing funded pre-school education (22 facilities, 20%).

This indicates that the targeted approach for the pre-school facilities in the 20% most deprived wards in Western Health and Social Care Trust has not been applied.

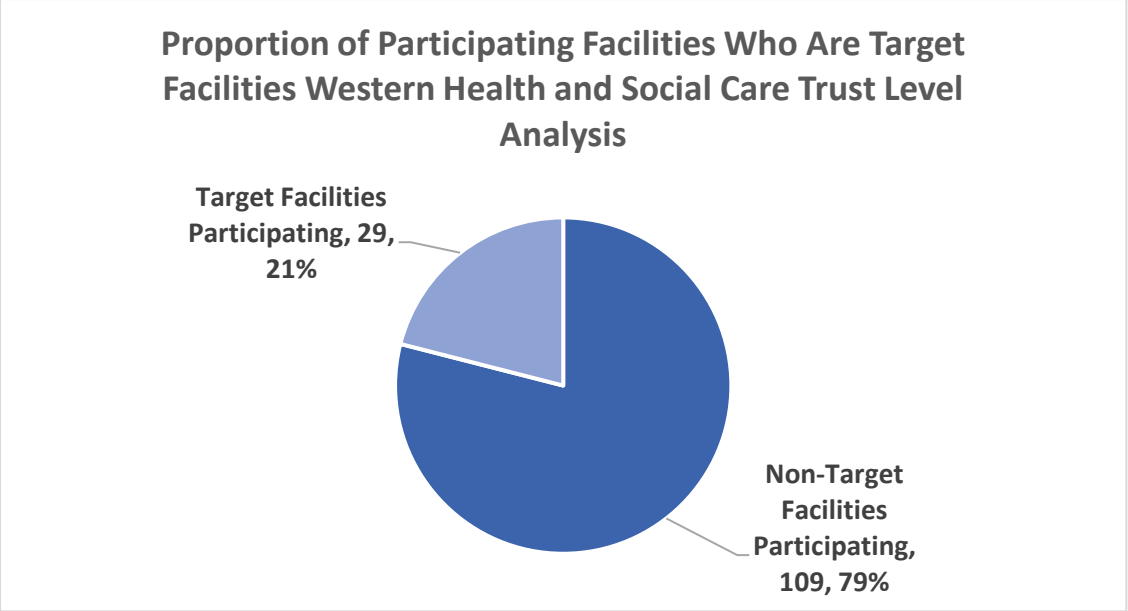


Figure 12: Proportion of Participating Facilities Who Are Target Facilities Western Health and Social Care Trust Level Analysis

Proportion of Target Facilities Who Participate Western Health and Social Care Trust Level Analysis

There are 32 target facilities in WHSCT, 29 target facilities participate in the *Happy Smiles Oral Health Programme* (91%) whilst 3 target facilities do not participate in the *Happy Smiles Oral Health Programme* (9%).

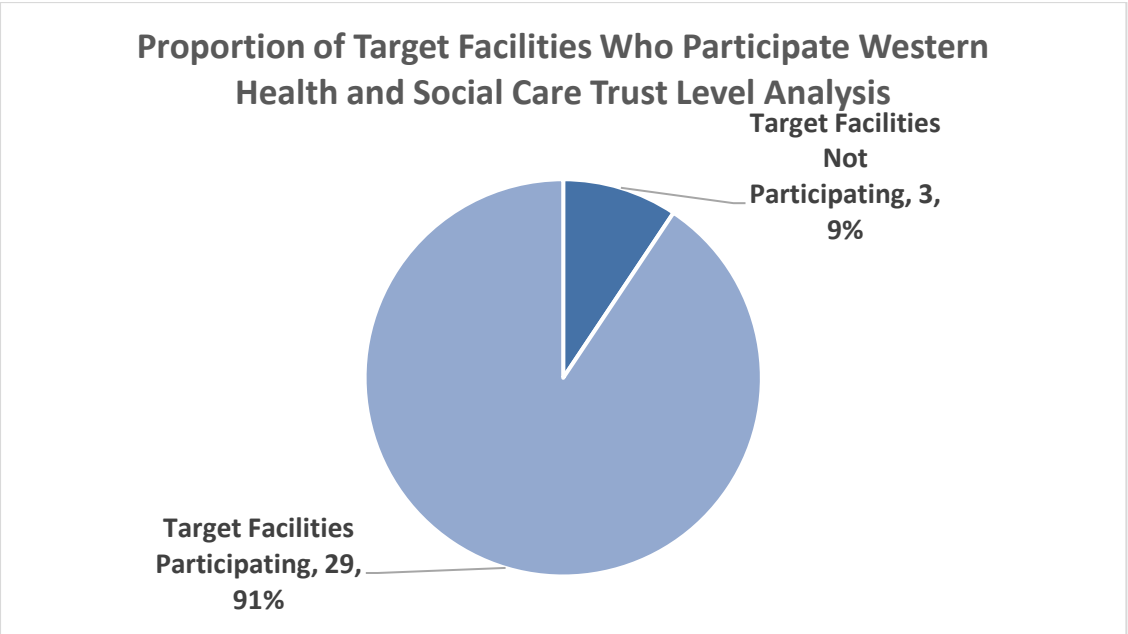


Figure 13: Proportion of Target Facilities Who Participate Western Health and Social Care Trust Level Analysis

Qualitative Evaluation Results Health and Social Care Trusts

Data Collection

The authors invited members of staff from all HSC Trusts to take part in semi-structured interviews. This involved a wide range of professionals, including service managers, therapists, dentists and oral health improvement staff involved in the delivery of the programme.

These interviews provided an additional opportunity to ask focussed questions based on themes emerging from the completed HSC stakeholder and education facility participant questionnaires. In particular, these interviews enabled the barriers and facilitators for the implementation or continued delivery of the different elements of *Happy Smiles Oral Health Programme* to be explored and evaluated.

They also facilitated the identification of key learning and provided clarity on some of the existent variation in delivery between HSC Trusts. Suggestions for improvement as well as areas of good practice/ innovation, particularly from alternative methods employed during the Covid-19 restrictions were also identified for potential shared learning/ programme improvement/ efficiency.

Barriers and Facilitators

Barriers and facilitators were categorised into 8 key overarching themes as described below (Table 10). Barriers to delivery of the *Happy Smiles Oral Health Programme* were identified as: 1) HSC Trust Staffing levels; 2) Funding; 3) Pre-school engagement and communication; 4) Pre-school Staff levels / capacity; 5) Environment/ Logistics; 6) Role clarity/ responsibility; 7) Participant factors and 8) The Covid-19 Pandemic.

Table 10: Barriers and facilitators to implementing the Happy Smiles Oral Health Promotion Programme for Pre-school Children in Northern Ireland.

Barriers	**Examples identified**	**Facilitators and examples of good practice/ solutions identified**
HSC Trust Staffing levels	▪ Time/ staff resources required to develop training resources for use with facility staff, especially in Trusts that have seen a turnover in staff from those involved in the original implementation of the *Happy Smiles Oral Health Programme*. ▪ Time/ staff resources required to provide face to face/ facility specific training. ▪ Time/ staff/ logistics required for physical delivery of the *Happy Smiles Oral Health Programme* pack materials to the participating facilities.	▪ Several examples of existing training materials identified including online presentations with video demonstrations which have already been developed at individual Trust level. ▪ Sharing/ updating of existing training materials between Trusts and development of regionally agreed materials held by SPPG coordinator as per the other *Happy Smiles Oral Health Programme* materials to improve sharing of knowledge/ standardisation regionally. ▪ Use of online training materials to provide the majority of the annual training enables efficient use of staff and reduction in time for travel and repeating training for each facility as online training facilitates multi facility participation (and peer learning opportunity).

	▪ Travel time to facilities for both of the above purposes increased in those HSC Trusts covering larger geographical areas.	▪ Utilisation of HSC Trust transport services and/ or utilisation of the companies providing the pack dental materials to deliver directly to pre-school facilities. ▪ Potential for further collaboration with SPPG *Happy Smiles Oral Health Programme* coordinator to have *Happy Smiles* paper materials delivered to supplier rather than Trusts, to further increase delivery efficiencies/ HSC staff time.
Funding ***The number funded pre-school education facilities in the 20% most deprived wards in each Health and Social Care Trust in NI varies between HSC Trusts as do the number of children within the facilities but this is not currently linked to funding.**	▪ Costs of implementing the *Happy Smiles Oral Health Programme* has increased since the original funding allocation with toothbrushing materials and staff costs having increased significantly. ▪ Changes/ reductions/ erosions of Trust budgets and allocations to dental services for the P*rogramme* delivery, at a time of increased costs especially in Trusts is proving challenging particularly for those Trust with greater numbers of participants ▪ Funding per Trust was not originally based on the number of children in funded pre-school education facilities in the 20% most deprived	▪ These factors should be considered and included in future business cases/ IPTs for potential expansion of the P*rogramme* and for continued current levels of P*rogramme* delivery in those Trust with highest numbers of children in the regional target cohort.

	wards in each Health and Social Care Trust in NI. *	
Pre-school engagement / communication	▪ Effective communication and engagement with facilities requires HSC staff time and expertise. ▪ Senior facility management attitudes towards the *Happy Smiles Oral Health Programme* / responsibility for children's dental health even if teachers are interested.	▪ Face to face/ facility visits yield high compliance and participation however is resource intensive. Therefore, of questionable benefit for long term participating facilities but could be utilised for facilities new to the P*rogramme* or with difficulty implementing. ▪ Highlighting relevance of the educational element of the Programme and linkage with curriculum therefore mutually beneficial. ▪ Using information on NI's $d_3$mft in 5yr olds, waiting lists/ GA levels to explain why this is so important to children's health and necessary life skill to be taught. ▪ Encourage empowerment and sense of achievement by utilising the certificate resources so that facilities can publicly display these.
Pre-school Staff levels / capacity	▪ Staff Training is required and needs repeated if there are staff changes. ▪ Staffing levels especially if using procedure requiring bathrooms / sinks to expectorate the toothpaste.	▪ Change to the alternative method that was used widely during the Covid-19 restart of the *Programme* of just using a napkin rather than spitting/ rinsing at a sink as reduces staff required

Environment/ Logistics	▪ Need for storage areas, sinks	▪ As above
Role clarity / responsibility: Oral Health not priority	▪ Opinions/ attitude of staff and decision makers to educations role on children's health	
Participant factors	▪ Increased SENS children who often find the process more difficult	▪ Utilise expertise and experience of CDS staff in supporting facility staff for tips/ advice. Examples include incorporation of this in the online training sessions and provision of alternative toothpastes if for example mint taste is an issue for some.
COVID-19 Pandemic	▪ Retention of participants ▪ Cross infection concerns	▪ Has provided opportunity to relaunch *Happy Smiles Oral Health Programme* to maximise participation. ▪ Demonstrated that online training and meetings were efficient / could be used going forward. ▪ Highlighted the method of using napkin rather than sink which reduces demands on facility staff.

Discussion

The qualitative data collected through these interviews identified many areas of good practice/ developments for overcoming potential barriers that should now be used regionally in the *Happy Smiles Programme* particularly if it is to be expanded going forward.

These include:

- Innovative ways of minimising the impact on already stretched HSC Trust staff resources such as usage/ sharing of online training resources and the utilisation of Trust transport services for pack distribution.

- Highlighting the relevance/ demonstrating linkage of the educational element of the Programme and linkage with curriculum to overcome the barriers in some facilities as to the role of educators in promoting oral health.

- Face to face/ facility visits yield high compliance and participation however is resource intensive and should be prioritised for those facilities that are new to the programme, indicating reluctance to continue/ participate as well as those where SENS children/ staff may benefit from the expertise and support from the HSC Trust Oral Health Promotion staff in providing potential adaptations such as provision of alternative toothpastes if taste is an issue thereby improving the equality in access to this programme.

- Continuing post Covid-19 pandemic, the method of using napkins rather than sinks which reduces demands on facility staff as can be done at their table/ same room.

Educational Facilities Questionnaire Analysis

Data Collection

An online questionnaire for stakeholders at each of the participating educational facilities was distributed by Microsoft Forms. This was facilitated by the *Happy Smiles* team in each HSCT distributing the link to the e-form to the facilities within their Trust location.

The questionnaire consisted of 36 closed and open-ended questions covering all aspects of the delivery of the *Happy Smiles Oral Health Programme* including any difficulties/ barriers as well as ideas for improvement. A summary of responses and themes emerging from the questionnaire is detailed in Table 11. Detailed responses to questions and further analysis of responses are included in Appendix B.

Data Analysis

Response Rate

73 of the 328 facilities participating in the *Happy Smiles Oral Health Programme* responded to the *Happy Smiles* Monitoring Questionnaire. This is a response rate of 22%.

Summary of Responses to Questionnaire

Table 11: Summary of Responses to Questionnaire

Themes	Summary of Responses	Recommendations
Praise for the Programme	▪ Children enjoy the programme ▪ Programme has a positive impact on children and their families.	▪ Continue to engage with facilities to ensure continuation of programme and continued positive impact on children and their families.
Barriers to Programme Implementation	▪ High levels of children with Special Educational Needs. ▪ Low staff availability within funded pre-school facilities. ▪ Not enough time to incorporate programme into the daily activities. ▪ Facilities feel parents need to take responsibility for brushing their children's teeth.	▪ Explore ways to address barriers identified.

Staff Training	▪ All staff in participating facilities have not received training for *Happy Smiles Programme*. ▪ Guidance provided to participating facilities rather than formal training. ▪ Lack of awareness of specific training pathways for participating staff. ▪ Some facilities reported incorrect amount of toothpaste for children to use for toothbrushing element of programme. Highlighting a training need.	▪ Review training of pre-school facilities provided by CDS teams to ensure regional approach is meeting minimum standards of *Happy Smiles Programme*. ▪ Identify areas of good practice for staff training, disseminate with CDS teams in each HSCT for opportunities for shared learning.
Community Dental Service Support	▪ Majority of facilities who responded (71%) found CDS very helpful and had good communication. ▪ Minority of facilities who responded (29%) felt they needed more support from CDS including the need for a visit from CDS team to facility and an understanding of CDS supervisory structure for the *programme*.	▪ Identify areas of good practice within HSCTs and opportunity for shared learning.
Awareness of Cross Infection Procedures	▪ Most participating facilities store toothbrushes and toothpaste in accordance with cross infection guidance.	▪ Ensure appropriate training of facilities and outline cross infection guidance in relation to the *Happy Smiles Programme*.

	▪ Distribution of toothpaste for individual use appropriate and in keeping with cross infection guidance.	
Healthy Snacks element of the *Programme*	▪ Majority of facilities (90%) implementing healthy snack element of the *Programme* with appropriate examples of health snacks included in responses to questionnaire.	▪ Develop resources to promote healthy snack element of the *Programme.*
Oral Health Education element of the *Programme*	▪ Majority of facilities (58%) implementing the oral health education element of the *Programme* with appropriate examples of play based oral health activities included in responses to questionnaire.	▪ Develop resources to promote oral health education element of the *Programme* with appropriate examples of play based oral health activities to be shared with facilities participating in the *Programme.*
Comments on how to improve the *Programme*	Responses included ▪ Visit to local dentist. ▪ Ensure parents are responsible for toothbrushing. ▪ Provision of dedicated toy to demonstrate appropriate toothbrushing. ▪ Provision of regular refresher training.	Share feedback with CDS teams in each HSCT. Explore ways to improve the *Programme* that can be implemented on a regional basis.

Oral Health Data Analysis

General Dental Services Data

General Dental Services (GDS) Statistics published by Business Services Organisation (BSO) June 2024[14] were analysed to report on outcome measures associated with oral health of children in Northern Ireland. The information detailed in 'Annual Dental Statistics Tables' is derived from the Family Practitioner Services (FPS) dental payment system. It includes all health service dental treatments carried out in Northern Ireland through the General Dental Services Regulations that are submitted by general dental practitioners to the BSO for payment. This information does not include any dental treatments delivered by Trust based dental services or any treatments carried out privately by health service dentists.

Dental Registrations

Dental registration data is reported based on registrations paid in March of each year with age calculated at 1st of March. Children are those under 18 while adults are those 18 and over. Once registered with a dentist, the patient will remain on that dentist's patient list for 24 months. This registration period will be extended if you return for another examination or further treatment during that period. Due to the Covid-19 pandemic all registrations that were due to expire in 2020/21, 2021/22 and 2022/23 were extended throughout these years. The first set of patient registrations expired at the end of March 2023. In order to avoid the scenario where a large number of patient registrations lapse in one go, the GDS regulations have been amended to add a specific number of months on to three patient registration cohorts, so that registrations are scheduled to lapse at the same rate as they would normally.

Figure 14 shows that child dental registration rates have remained relatively stable over the last ten years with 76% of children registered with a health service dentist in Northern Ireland as of June 2024.

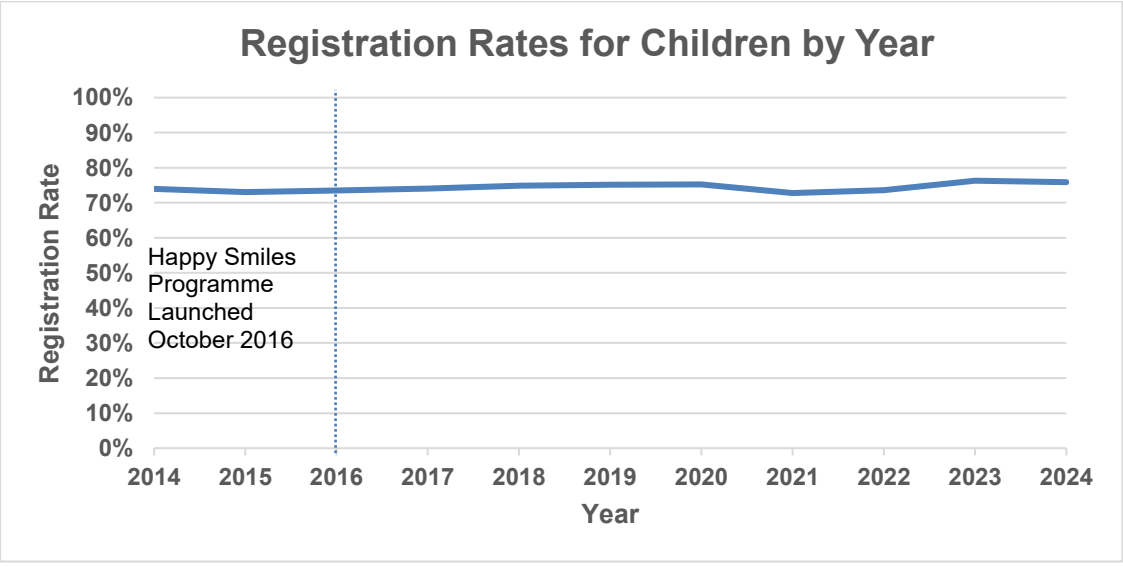


Figure 14: Registration Rates for Children by Year

Children Seen as Proportion of Registered

Figure 15 shows a graphical presentation of children seen as a proportion of children who are registered with a health service dentist. This metric is only available on data from financial year 2017/18 onwards. From 2017/18 to 2019/20 children seen as a proportion of registered remained relatively stable at around 93%. In 2020/21 there was a decrease to only 34% of registered child population being seen by the dentist. This can be explained by advice implemented on 23rd March 2020. General dental practitioners (GDPs) were advised to continue to see patients who did not meet the Covid-19 case definition and who required urgent dental care which could be provided using non-aerosol generating procedures (AGPs) however all routine dental treatment was to be postponed. Guidance issued by the Department of Health permitted a phased re-establishment of dental services from 29th June 2020[24]. This enabled a phased increase in activity however waiting list backlogs continued to impact access to services. There has been some recovery of children seen as a proportion of children registered in recent years with 2023/24 data showing that 76.5% of children with NHS dental registration seen by their dentist.

This evidences that, whilst registration rates have remained steadily high for children, this does not equate to access to Health Service general dental services with the proportion of registered children seeing the dentist falling from 93.8% in 2017/18 to 76.5% in 2023/24.

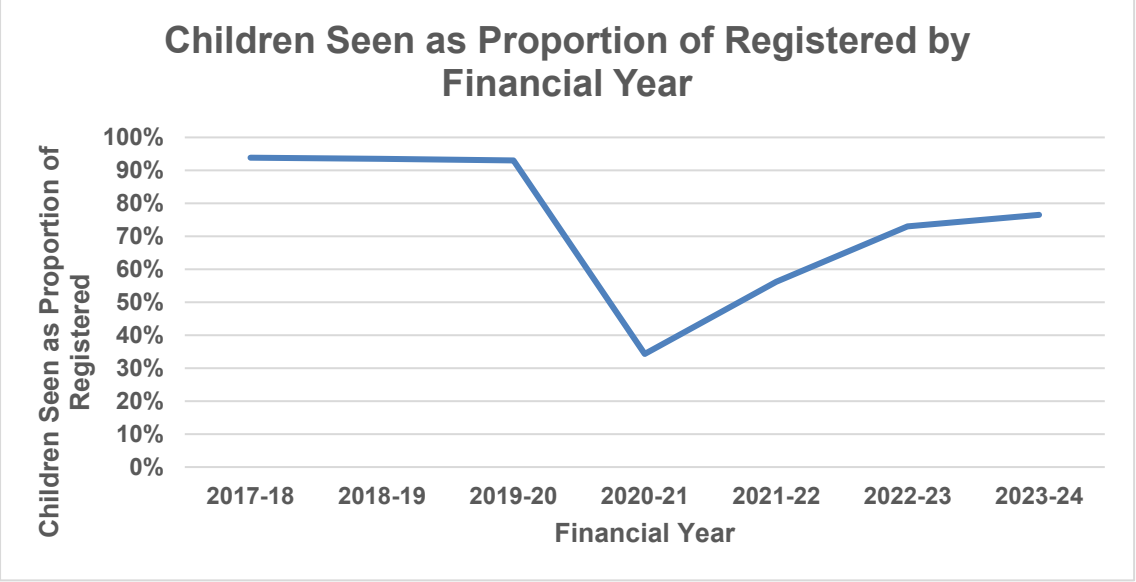


Figure 15: Children Seen as Proportion of Registered

Unique Patients Treated (Filling) by Financial Year- Children

Figure 16 shows a graphical presentation of the number of unique patients treated by financial year for children. This is the number of unique child patients who have had a filling per financial year. A downward trend in the number of unique child patients who have had a filling by financial year existed before the introduction of the *Happy Smiles Programme* in October 2016 (2013/14 83,320 patients, 2016/17 75,127 patients). This downward trend continued after the introduction of the *Happy Smiles Programme* with a decrease from 75,127 unique child patients who have had a filling during financial year 2016/17 to 53,288 in financial year 2023/24. The decrease in 2020-21 to 21,068 unique child patients who have had a filling in that financial year can be explained by the restrictions introduced due to the Covid-19 pandemic. The steepness of the trend line is not sustained after the introduction of the *Happy Smiles Programme,* therefore it is unlikely that this decrease in unique child patients who have had a filling is attributable solely to the Programme.

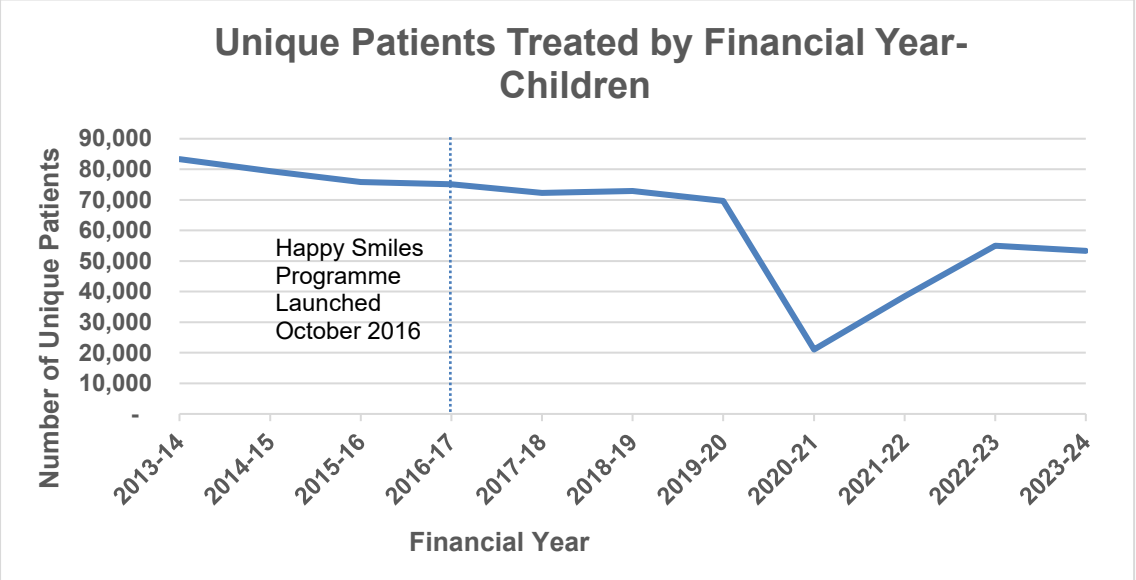


Figure 16: Unique Patients Treated (Filling) by Financial Year-Children

Teeth Filled by Financial Year- Children

Figure 17 shows a graphical presentation of the number of teeth filled by financial year for children. Over the last ten years there has been an overall decrease in the number of teeth filled by financial year for children. A downward trend in the number of teeth filled by financial year for children existed before the introduction of the *Happy Smiles Programme* in October 2016 (2013/14 228,686, 2016/17 200,384). This downward trend continued after the introduction of the *Happy Smiles Programme* with a decrease from 200,384 teeth filled for children in 2016/17 to 136,414 in 2023/24. The decrease in 2020-21 to 45,542 teeth filled for children can be explained by the restrictions introduced due to the Covid-19 pandemic. The steepness of the trend line is not sustained after the introduction of the *Happy Smiles Programme,* therefore it is unlikely that this decrease in number of teeth filled is attributable solely to the Programme.

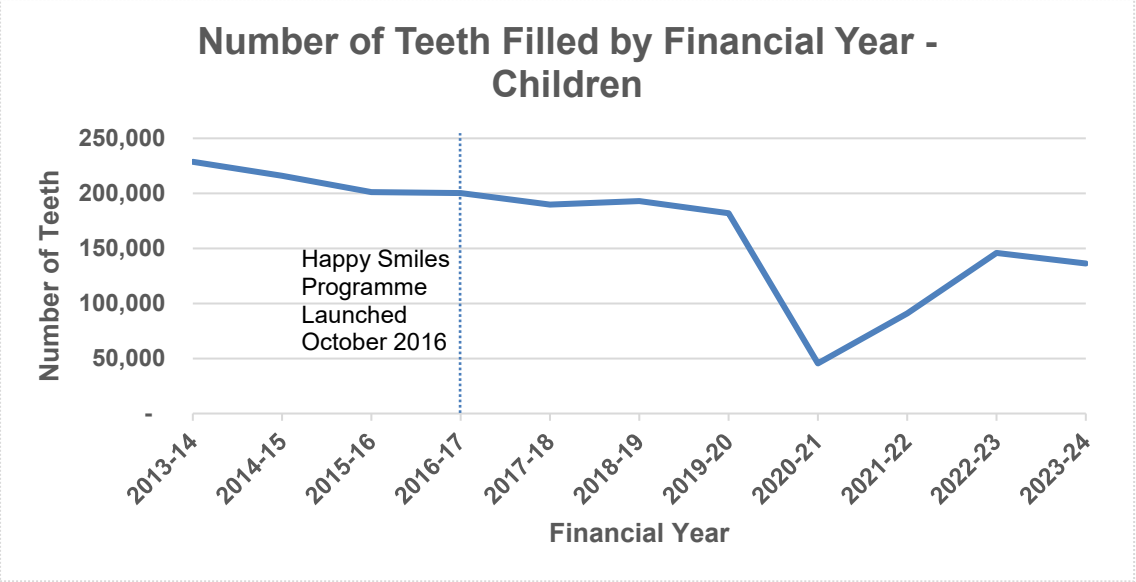


Figure 17: Number of Teeth Filled by Financial Year – Children

Mean number of Teeth Filled per Patient Treated by Financial Year - Children

Figure 18 shows a graphical presentation of the mean number of teeth filled per patient who had a tooth filled per financial year for children. This has remained relatively stable over the last 10 years with an average of 2.74 teeth filled per child that had a tooth filled in 2013-14 to 2.56 teeth in 2023-24. There is a decrease in 2020-21 to 2.16 teeth filled per child that had a tooth filled which can be explained by the restrictions introduced due to the Covid-19 pandemic. The *Happy Smiles Programme* does not appear to have had an impact on the average number of teeth filled per child that had a tooth filled.

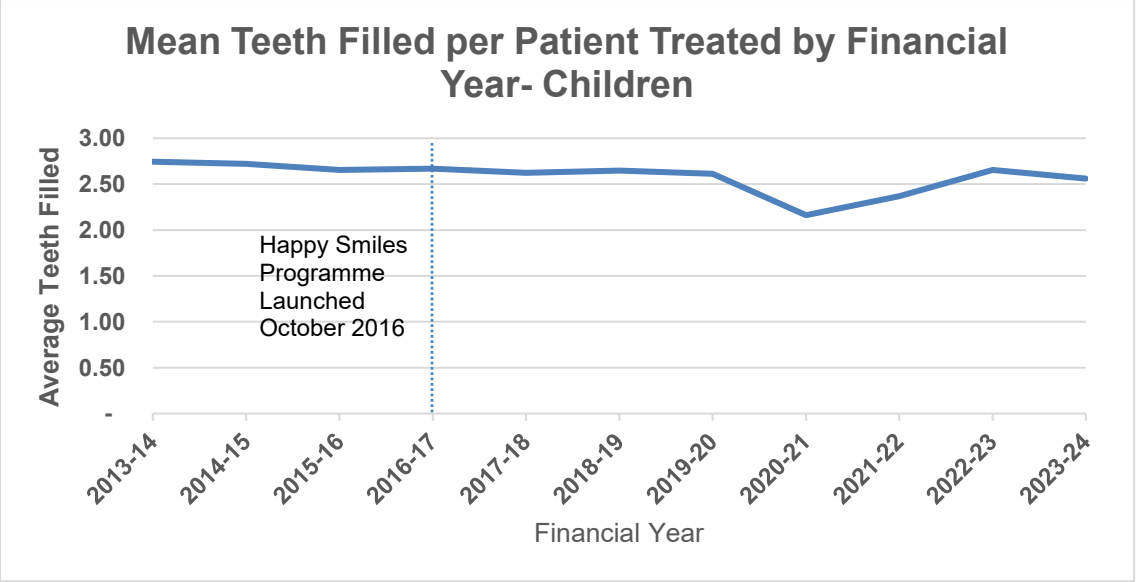


Figure 18: Average Teeth Filled per Patient Treated by Financial Year - Children

Percentage of Registered Patients who had a Tooth Filled by Financial Year- Children

Figure 19 shows a graphical presentation of the percentage of registered patients who had a tooth filled by financial year for children. Over the last ten years there has been an overall decrease in the percentage of registered patients who had a tooth filled by financial year for children. A downward trend in the percentage of registered patients who had a tooth filled by financial year for children existed before the introduction of the *Happy Smiles Programme* in October 2016. This downward trend continued after the introduction of the *Happy Smiles Programme* with a decrease from 23.3% of registered patients who had a tooth filled by financial year for children 2016/17 to 16.1% in 2023/24. The decrease in 2020-21 to 6.6% of registered patients who had a tooth filled by financial year for children can be explained by the restrictions introduced due to the Covid-19 pandemic. The *Happy Smiles Programme* may have had an impact on the percentage of registered patients who had a tooth filled by financial year for children.

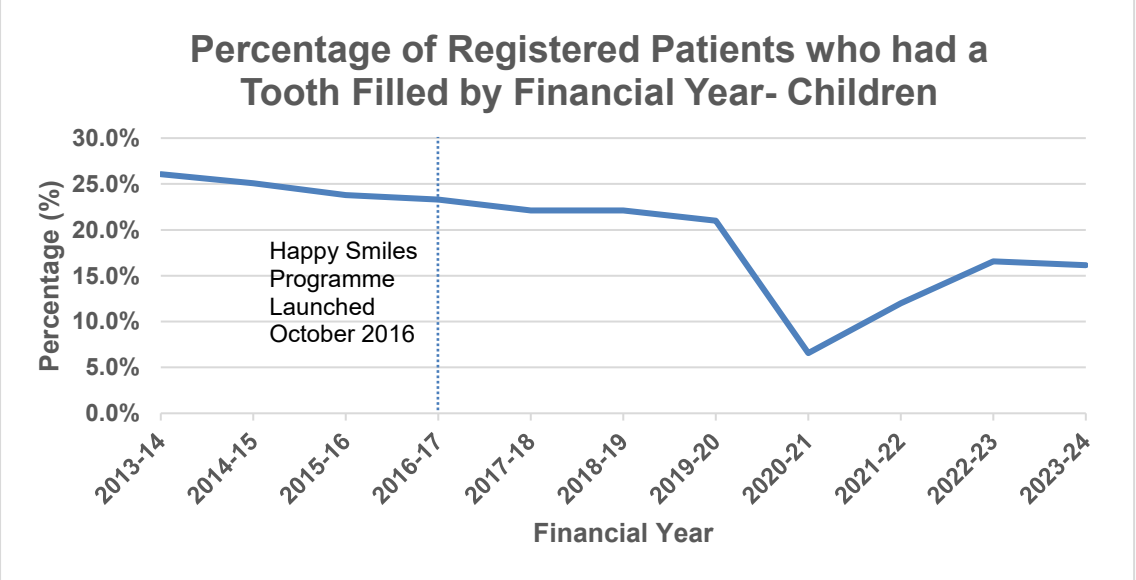


Figure 19: Percentage of Registered Patients who had a Tooth Filled by Financial Year- Children

Unique Patients Treated (Extraction) by Financial Year- Children

Figure 20 shows a graphical presentation of the number unique patients treated by financial year for children. This is the number of unique child patients who have had an extraction per financial year. A downward trend in the number of unique child patients who have had an extraction by financial year existed before the introduction of the *Happy Smiles Programme* in October 2016 (2013/14 20,340 patients, 2016/17 18,535 patients). This downward trend continued after the introduction of the *Happy Smiles Programme* with a decrease from 18,535 unique child patients who have had an extraction by financial year 2016/17 to 16,164 by financial year 2023/24. The decrease in 2020-21 to 9,091 unique child patients who have had an extraction by financial year can be explained by the restrictions introduced due to the Covid-19

pandemic. The steepness of the trend line was sustained after the introduction of the *Happy Smiles* Programme up to the Covid-19 pandemic. The *Happy Smiles Programme* may have had an impact on the unique child patients who have had an extraction by financial year.

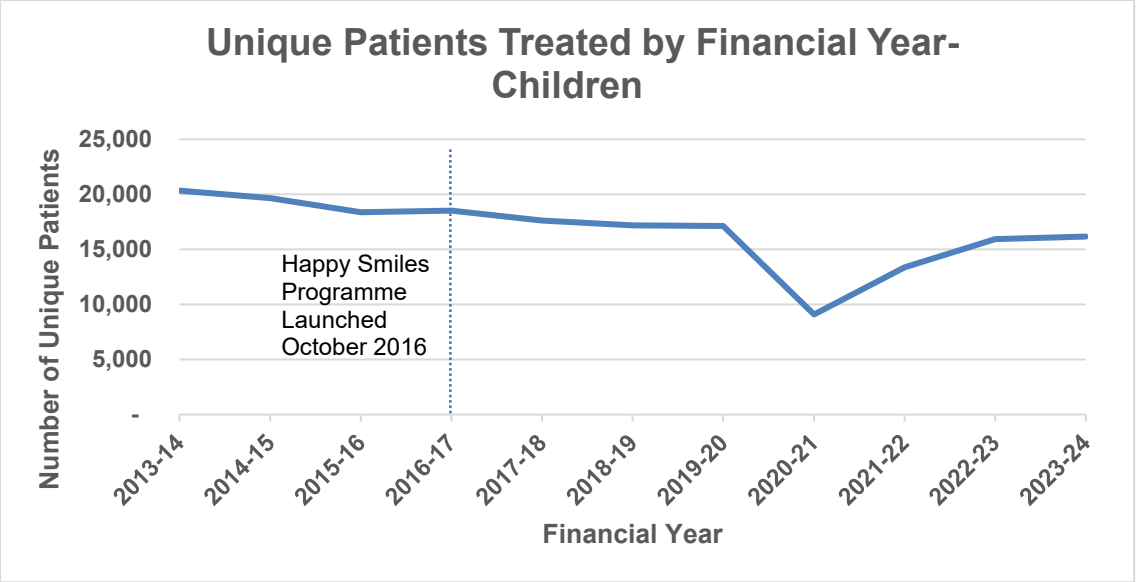


Figure 20: Unique Patients Treated (Extraction) by Financial Year- Children

Teeth Extracted by Financial Year- Children

Figure 21 shows a graphical presentation of the number of teeth extracted by financial year for children in GDS. Over the last ten years there has been an overall decrease in the number of teeth extracted by financial year for children. A downward trend in the number of teeth extracted by financial year for children existed before the introduction of the *Happy Smiles Programme* in October 2016 (2013/14 34,992, 2016/17 31,856). This downward trend continued after the introduction of the *Happy Smiles Programme* with a decrease from 31,856 teeth extracted by financial year for children 2016/17 to 28,269 teeth extracted by financial year for children 2023/24. The decrease in 2020-21 to 14,451 teeth extracted by financial year for children can be explained by the restrictions introduced due to the Covid-19 pandemic. The steepness of the trend line was sustained after the introduction of the *Happy Smiles* Programme up to the Covid-19 pandemic The *Happy Smiles Programme* may have had an impact on the number of teeth extracted by financial year for children.

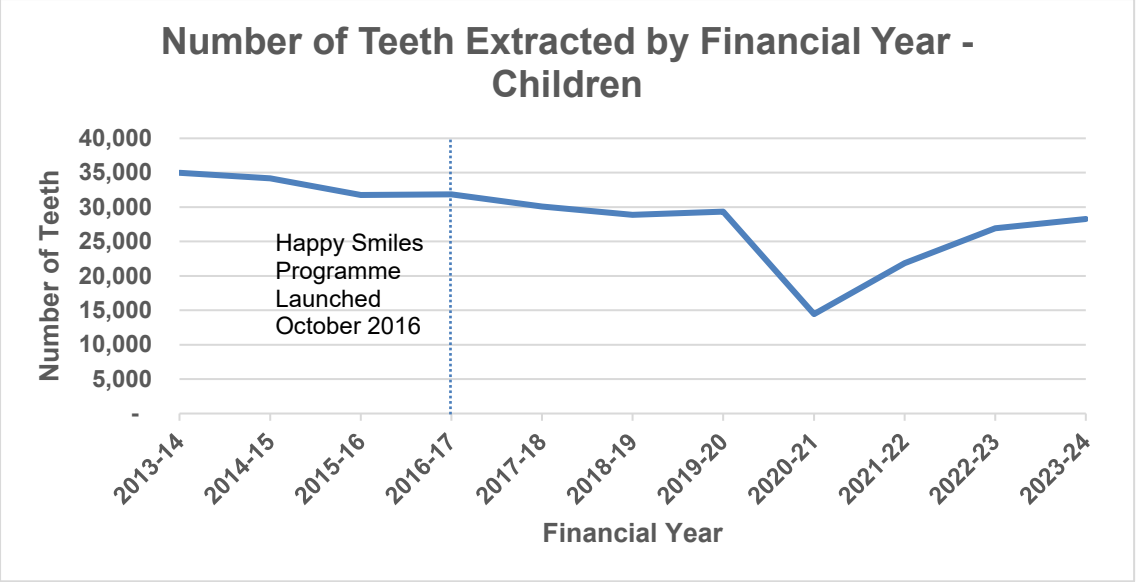


Figure 21: Number of Teeth Extracted by Financial Year in the GDS – Children

Average Teeth Extracted per Patient Treated by Financial Year - Children

Figure 22 shows a graphical presentation of the average number of teeth extracted per patient who had a tooth extracted in the GDS per financial year for children. This has remained relatively stable over the last 10 years with an average of 1.72 teeth extracted per child that had a tooth extracted in 2013-14 to 1.75 teeth extracted per child that had a tooth extracted in 2023-24. There is a decrease in 2020-21 to 1.59 teeth extracted per child that had a tooth extracted which can be explained by the restrictions introduced due to the Covid-19 pandemic. The *Happy Smiles Programme* does not appear to have had an impact on the average number of teeth extracted per child that had a tooth extracted.

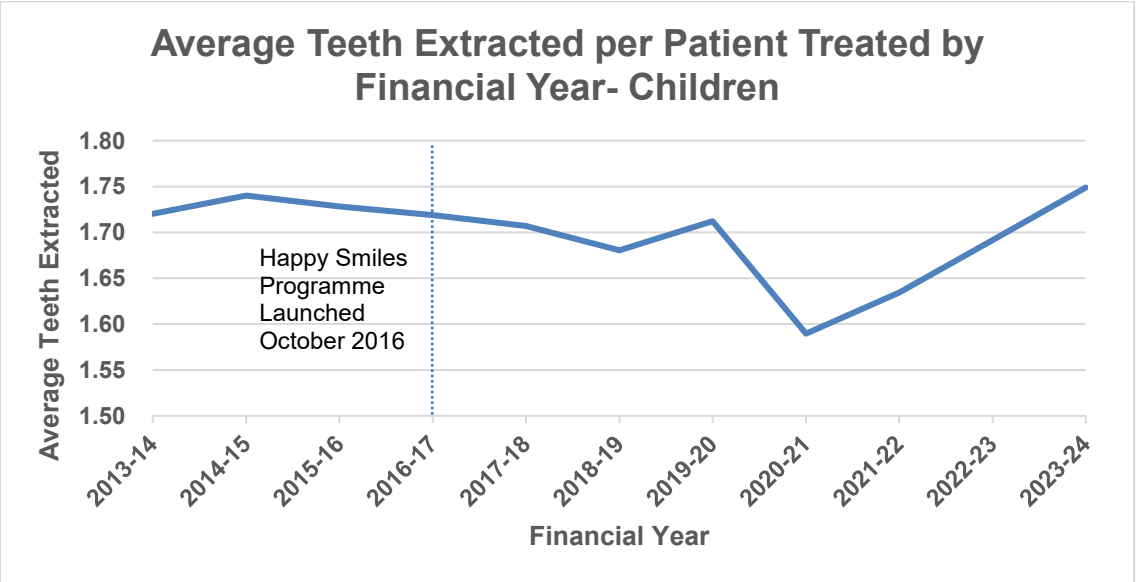


Figure 22: Average Teeth Extracted per Patient Treated by Financial Year- Children

Percentage of Registered Patients who had a Tooth Extracted by Financial Year- Children

Figure 23 shows a graphical presentation of the percentage of registered patients who had a tooth extracted by financial year for children. Over the last ten years there has been an overall decrease in the percentage of registered patients who had a tooth extracted by financial year for children. A downward trend in the percentage of registered patients who had a tooth extracted by financial year for children existed before the introduction of the *Happy Smiles Programme* in October 2016 (2013/14 6.4%, 2016/17 5.7%). This downward trend continued after the introduction of the *Happy Smiles Programme* with a decrease from 5.7% of registered patients who had a tooth extracted by financial year for children 2016/17 to 4.9% of registered patients who had a tooth extracted by financial year for children 2023/24. The decrease in 2020-21 to 2.8% of registered patients who had a tooth extracted by financial year for children can be explained by the restrictions introduced due to the Covid-19 pandemic. The steepness of the trend line was sustained after the introduction of the *Happy Smiles* Programme up to the Covid-19 pandemic The *Happy Smiles Programme* may have had an impact on the percentage of registered patients who had a tooth extracted by financial year for children.

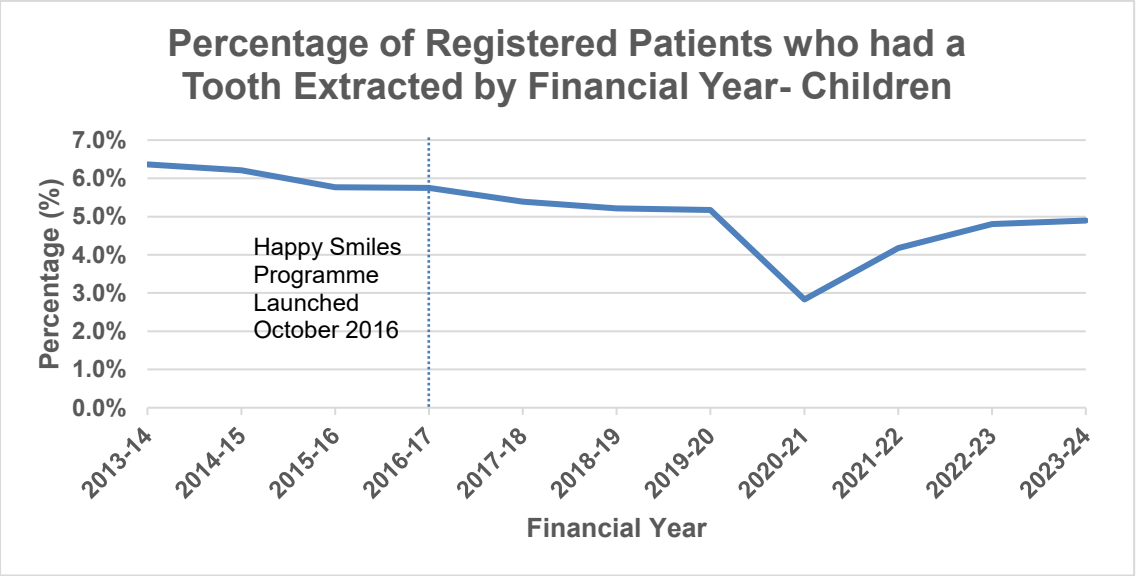


Figure 23: Percentage of Registered Patients who had a Tooth Extracted by Financial Year- Children

Discussion General Dental Services Data

GDS data shows that whilst dental registration rates have remained steadily high for children over the last ten years both prior to and following the implementation of the *Happy Smile Programme,* children seen as a proportion of children registered with the dentist has decreased. This indicates that high levels of child dental registration do not correlate to high levels of access to dental services. There are many reasons for this including the impact of Covid-19 restrictions and back logs of patients as well as a transition of dentists away from health service dental services towards private dental care. These access issues will need to be taken into consideration when interpreting the GDS data that has been presented in this evaluation.

There has been a decrease in both the number of unique patients who had a filling and the number of unique patients who had an extraction per financial year over the last ten years both before and after the implementation of the *Happy Smiles Programme*. Similarly, there has been a decrease in both the number of teeth filled and the number of teeth extracted for children per financial year over the last ten years both before and after the implementation of the *Happy Smiles Programme.* There has also been a decrease in the percentage of registered patients who had a tooth filled and the percentage of registered patients who had a tooth extracted for child patients per financial year over the last ten years both before and after the implementation of the *Happy Smiles Programme.*

In contrast the average number of teeth filled per child that had a tooth filled and the average number of teeth extracted per child that had a tooth extracted per financial year has remained relatively stable over the last ten years both before and after the implementation of the *Happy Smiles Programme*.

This decrease in the number of patients treated (fillings and extractions), the number of teeth treated (fillings and extractions) and the percentage of registered child patients who had treatment (fillings and extractions) may evidence improved oral health. This apparent improvement in oral health of children may be attributable to the implementation of the *Happy Smiles Programme* and could be interpreted as a successful outcome of the *Programme*. We must however interpret results with caution, considering the *Happy Smiles Programme* had a targeted rather than universal approach to facility participation it can only explain the improved oral health of the proportion of children who participated in the programme. Other possible explanations for recent improvement in oral health must be considered and may include the introduction of a ‘Food in Schools Policy’ 2013 [25], the introduction of the ‘Soft Drinks Industry Levy’ 2018 [25] and improved use of fluoride toothpaste in the population which are likely to have had an impact on oral health and reach a wider proportion of the population than the targeted *Happy Smiles Programme*.

We must consider that the decrease in the number of patients treated (fillings and extractions), the number of teeth treated (fillings and extractions) and the percentage of registered child patients who had treatment (fillings and extractions) may not

evidence improved oral health. Other explanations for these decreases may include decreased access to health service dental services due to the impact of Covid-19 restrictions and back logs of patients as well as a transition of dentists away from health service dental services towards private dental care. The impacts of decreased access to dental services evidenced through a decrease in the children seen as a proportion of children registered may result in undiagnosed disease leading to a decrease in the number of fillings and extractions recorded through GDS treatment claims. This could indicate a decrease in supply of dental care rather than a decrease in need and demand for dental care.

Consideration must also be given to the average number of teeth filled per child that had a tooth filled and the average number of teeth extracted per child that had a tooth extracted per financial year which remained relatively stable over the last ten years. This piece of data may represent disease concentration in certain groups of the population. There may be evidence of persistent inequalities, those from socially deprived or marginalised groups in society may have persistent oral health inequalities and not have the same improvements to their oral health as wider society.

General Anaesthetics Data

The Performance, Safety and Service Improvement Directorate (PSSID) collate information on community dental services activity. Some patients, because of their age or special needs, are unable to undergo routine dental care such as extractions in GDS and they may need general anaesthetic (GA) to receive their dental care. This section presents data and information relating to dental extractions under general anaesthetic in Trusts across Northern Ireland. Children treated by the specialist paediatric dental department in Royal Belfast Hospital for Sick Children are not included in this data.

The Department of Health collected high level data on GA extractions from HSC Trusts from 2002 until 2013 by calendar year. The former Health and Social Care Board (HSCB) introduced a new information collection process from HSC Trusts commencing in fiscal year 2014/15. Consequently, there is a gap in information for the period January to March 2014. There is no data on GA extractions for BHSCT fiscal year 2015/16.

General Anaesthetic Sessions Carried Out Per Year- Children

Figure 24 shows a graphical presentation of the number of GA sessions carried out per year for children. The number of GA sessions carried out per year varied between 700 and 800 sessions from 2013 to 2019-20. There is a downward trend for 2020-21 and 2021-22 to a low of 468 sessions which can be explained due to restrictions in access to theatres as a result of the impact of the Covid-19 pandemic. Data for 2022-23 shows an upward tick to 523 GA sessions per year.

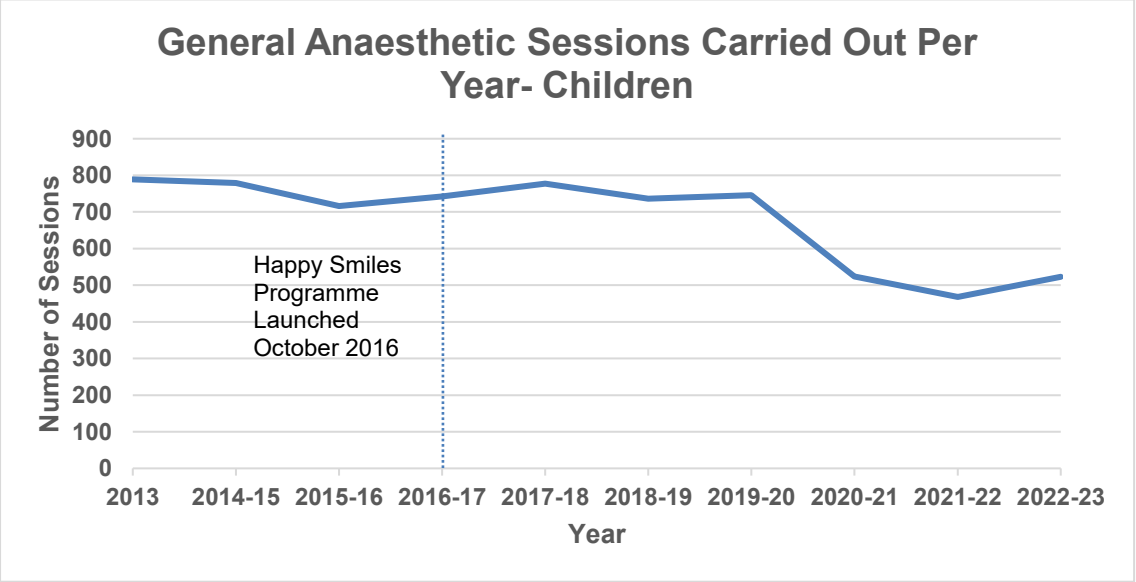


Figure 24: General Anaesthetic Sessions Carried Out Per Year- Children

General Anaesthetic Cases Per Year- Children

Figure 25 shows a graphical presentation of the number of GA cases carried out per year for children. A downward trend in the number of GA cases per year existed before the introduction of the Happy Smiles Programme in October 2016 (2013, 5,351 GA cases per calendar year, 2016-17 5,122 GA cases per fiscal year). This downward trend continued after the introduction of the Happy Smiles Programme with a decrease from 5,122 GA cases per fiscal year 2016-17 to 2,534 GA cases per fiscal year 2022-23. The decrease in 2020-21 to 1,539 and 2021-22 to 2,077 GA cases per fiscal year can be explained by the restrictions introduced due to the Covid-19 pandemic. The steepness of the trend line is not sustained after the introduction of the *Happy Smiles Programme,* therefore it is unlikely that this decrease in number of general anaesthetic cases is attributable solely to the Programme.

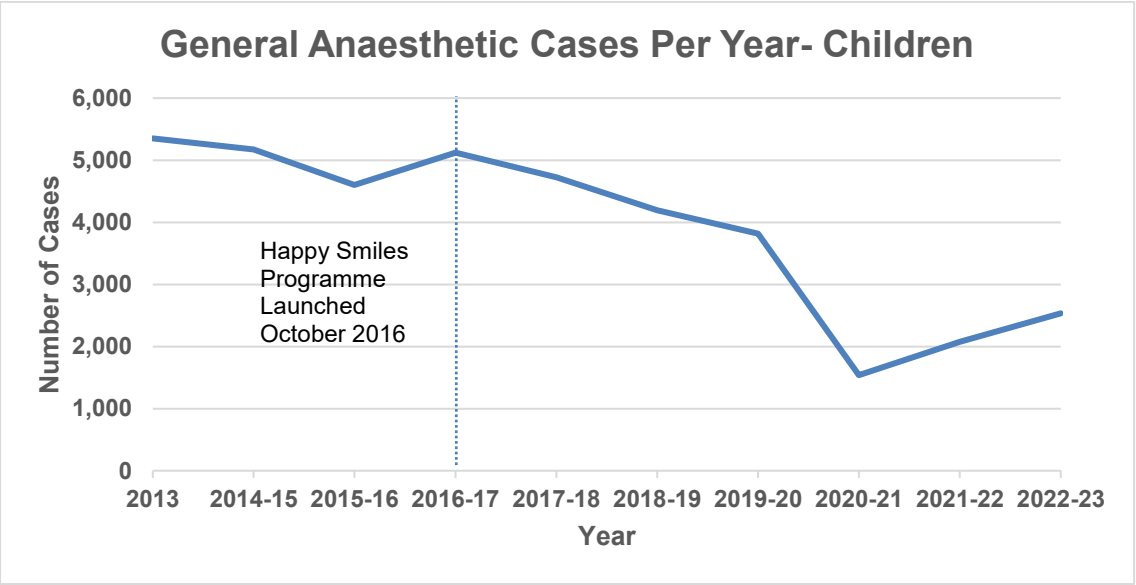


Figure 25: General Anaesthetic Cases Per Year- Children

Total Teeth Extracted Under General Anaesthetic Per Year- Children

Figure 26 shows a graphical presentation of the total teeth extracted under GA per year for children. A downward trend in the total teeth extracted under GA per year existed before the introduction of the *Happy Smiles Programme* in October 2016 (2013 24,154 total teeth extracted under GA per calendar year, 2016/17 22,699 total teeth extracted under GA per fiscal year). This downward trend continued after the introduction of the *Happy Smiles Programme* with a decrease from 22,699 total teeth extracted under GA per fiscal year 2016/17 to 16,018 total teeth extracted under GA per fiscal year 2022-23. The decrease in 2020-21 to 9,014 and 2021-22 to 13,033 total teeth extracted under GA per fiscal year can be explained by the restrictions introduced due to the Covid-19 pandemic. The *Happy Smiles Programme* may have had an impact on the total teeth extracted under GA per year.

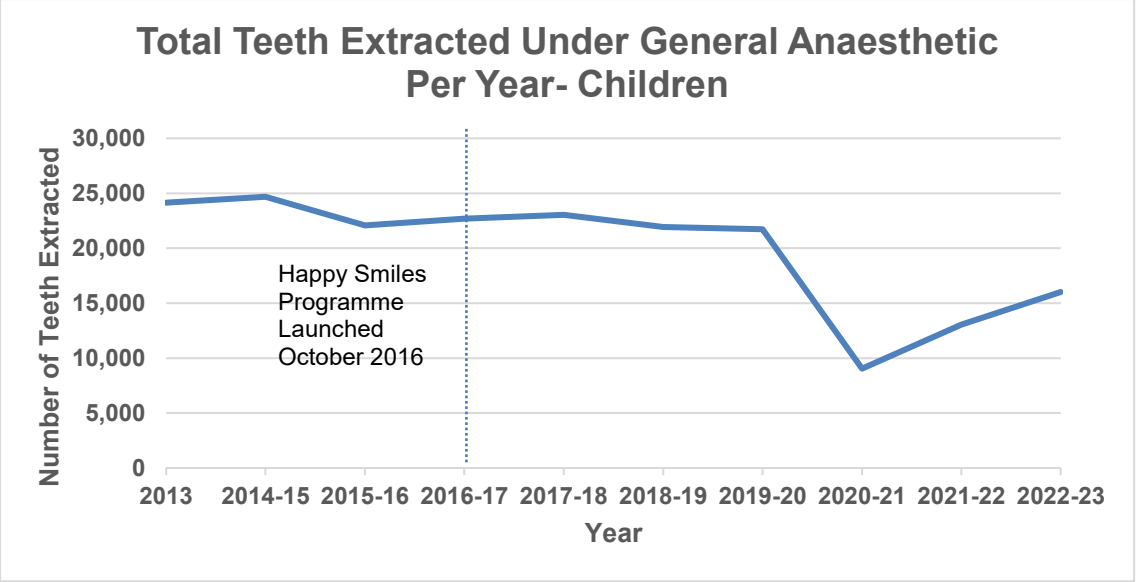


Figure 26: Total Teeth Extracted Under General Anaesthetic Per Year- Children

Average Number of Teeth Extracted Per Patient Per Year Under General Anaesthetic- Children

Figure 27 shows a graphical presentation of the average number of teeth extracted per patient per year under general anaesthetic for children. There has been an increase over the last 10 years with an average of 4.5 teeth extracted per patient per year under general anaesthetic in 2013 to an average of 6.3 teeth extracted per patient per year under general anaesthetic 2022-23. The *Happy Smiles Programme* does not appear to have had an impact on the average number of teeth extracted per patient per year under general anaesthetic.

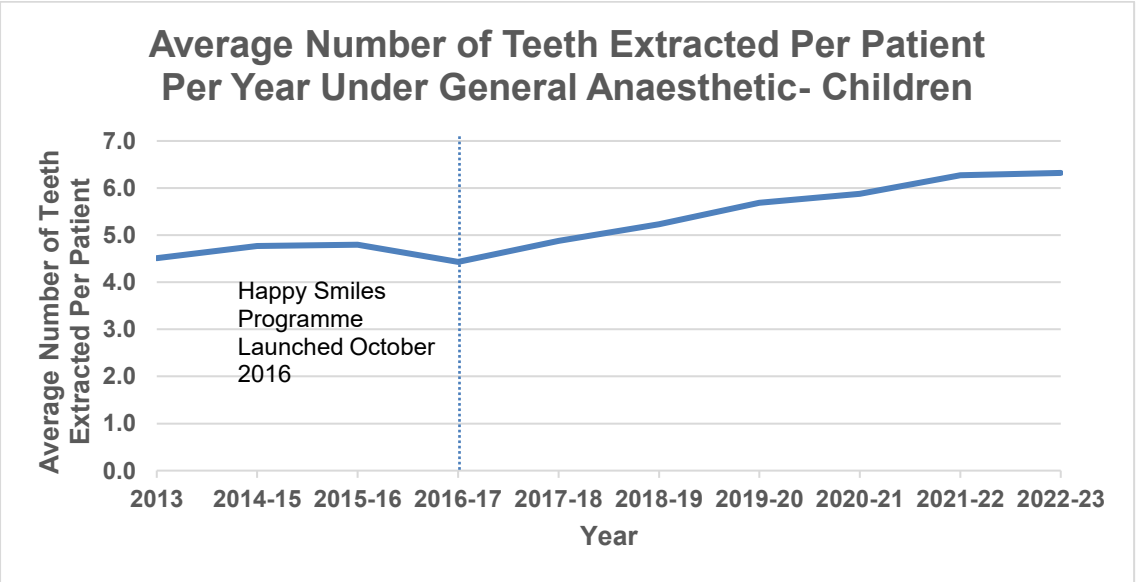


Figure 27: Average Number of Teeth Extracted Per Patient Per Year Under General Anaesthetic- Children

Discussion General Anaesthetic Data

Whilst GA data shows that there has been a decrease in the number of GA sessions per year, a decrease in the number of GA cases per year and a decrease in total teeth extracted per year both prior to and following the implementation of the *Happy Smiles Programme*, this does not coincide with a decrease in the average number of teeth extracted per patient per year which was relatively stable prior to the introduction of the *Happy Smiles Programme* and increased following the implementation of the *Programme*.

This decrease in the number of GA sessions and number of GA cases per year may evidence improved oral health. This apparent improvement in oral health of children may be attributable to the implementation of the *Happy Smiles Programme* and could be interpreted as a successful outcome of the *programme*. We must however interpret results with caution, considering the *Happy Smiles Programme* had a targeted rather than universal approach to facility participation it can only explain the improved oral health of the proportion of children who participated in the programme. Other possible explanations for recent improvement in oral health must be considered and may include the introduction of a 'Food in Schools Policy' 2013 [25] and the introduction of the 'Soft Drinks Industry Levy' 2018 [26] which are both likely to have had an impact on oral health and reach a wider proportion of the population than the targeted *Happy Smiles Programme*.

We must consider that the decrease in number of GA sessions and number of GA cases per year may not evidence improved oral health. Other explanations for these decreases may include the impact of Covid-19 restrictions, access to theatres, staff shortages applicable to community dental services. These figures may also be impacted by access issues in general dental practice and subsequent delay in onward referral to community services. Likewise backlogs and waiting lists in community dental services can impact assessment for dental GA. This could indicate a decrease in supply of dental GA rather than a decrease in need and demand for dental GA.

Consideration must also be given to the average number of teeth extracted per patient This piece of data may represent disease concentration in certain groups of the population. There may be evidence of persistent inequalities, those from socially deprived or marginalised groups in society may have persistent oral health inequalities and not have the same improvements to their oral health as wider society. Other explanations for an increase in the average number of teeth extracted per patient may include:

- changes to treatment planning within the profession and the need to reduce repeat Dental GAs resulting in more comprehensive treatment planning.
- A further explanation could be that the decrease in GA sessions and cases per year may indicate an access issue, with resultant backlogs of patients awaiting GA for dental treatment,

- whilst on waiting lists oral health may have further deteriorated resulting in increased unrestorable teeth and therefore increasing the average number of teeth extracted per patient.

Consideration must also be given to the length of time it would take for any impact of the *Happy Smiles Programme* to be evidenced in general anaesthetic data. This along with the other factors mentioned are areas for further evaluation to give a more in-depth understanding of the data.

Oral Health Survey Data

Given that different epidemiological surveys in NI and other parts of the UK have used different methodologies and terminology, comparing the data accurately and looking for long term trends has been challenging in recent years.

Notwithstanding these differences, the Child Dental Health Survey (CDHS) 2013 [27] which would have predated the introduction of the *Happy Smiles Programme,* can be used to suggest developing long term trends with regards to some of the indicators measured. The CDHS 2013 defines primary teeth with obvious decay experience with visual dentine caries as having untreated decay to dentinal level (visual dentine caries and cavitated dentine caries) or as being filled. The CDHS methodology assumes that the attribution of missing teeth due to decay cannot be made in this age cohort and so all missing teeth are excluded from this measure in 5-yr-olds in the report of that survey. This results in an underestimation of decay experience.

Looking to the more recent NI surveys of 5-year old children, the analysis can also be limited to filled teeth due to decay (ft) and teeth with visually obvious decay into dentine (d_3t) to facilitate establishing a comparable indicator. Using these comparable measures, the proportion of children with no obvious dentinal decay experience improved from 60% in the CDHS 2013, to 69.97% in the NI 2018-19 survey and 69.73% in the 2021-22 survey. There has also been an improvement in the mean number of decayed or filled teeth which has fallen from 1.40 (CDHS 2013) to 1.05 (2018/19) and 1.03 in the 2021-22 survey.

The recent survey data suggests a marked overall improvement in the oral health of 5-year-old children in NI when compared to previous data such as that from the Child Dental Health Survey 2013 but not when compared to the decay experience identified in the 2018-19 survey. It also demonstrates the burden/ severity of disease in those with decay experience and the continued inequalities in Northern Ireland with higher decay experience and severity in children from deprived areas. This would be consistent with trends identified in comparative surveys in England although decay prevalence remains higher in NI than in England especially with regards to enamel caries experience.

Comparison of Facilities eligible to participate in *Happy Smiles Oral Health Programme* using 20% most deprived wards at Health and Social Care Trust Level methodology and 20% most deprived wards at Northern Ireland Level methodology.

A further piece of analysis was completed. This included identification of facilities providing funded pre-school education in the 20% most deprived wards in each Health and Social Care Trust, identification of facilities providing funded pre-school education in the 20% most deprived wards in Northern Ireland and comparison of facilities who would be eligible to participate in *Happy Smiles Oral Health Programme* when each methodology is applied (20% most deprived wards HSCT Level compared to 20% most deprived wards NI Level).

Data Collection

A list of the Electoral Ward (Ward2014) level Domain Measures of Deprivation was obtained from Northern Ireland Statistics and Research Agency (NISRA)[20] A desktop exercise was completed to assign each Electoral Ward (Ward2014) in Northern Ireland to the correct location within each of the 5 HSC Trust geographical boundaries in NI, this was completed by using the NISRA Boundary Application[21] which is provided by Ordinance Survey of Northern Ireland. A further desktop exercise was undertaken to identify the 20% most deprived wards at Health and Social Care Trust Level and 20% most deprived wards at Northern Ireland Level.

A list of facilities providing funded pre-school education in NI was obtained from the Department of Education website.[22] This was analysed and filtered to provide a summary of facilities providing funded pre-school education in each of the 5 HSC Trusts. A desktop exercise was completed to identify facilities providing funded pre-school education eligible to participate in the *Happy Smiles Oral Health Programme* using the 20% most deprived wards at Health and Social Care Trust Level methodology and facilities providing funded pre-school education who would be eligible to participate in the *Happy Smiles Oral Health Programme* using the 20% most deprived wards at Northern Ireland Level methodology.

The analysis compares the facilities providing funded pre-school education eligible to participate in the *Happy Smiles Oral Health Programme* using the current 20% most deprived wards at Health and Social Care Trust Level methodology to facilities providing funded pre-school education who would be eligible to participate in the *Happy Smiles Oral Health Programme* using the 20% most deprived wards at Northern Ireland Level methodology.

Wards

There are 462 electoral wards in Northern Ireland. There are different numbers of wards in each HSCT, BHSCT 69 wards, NHSCT 134 wards, SEHSCT 89 wards, SHSCT 80 wards, WHSCT 90 wards.

The methodology of 20% most deprived wards at Health and Social Care Trust Level was applied to select the number of wards that should be included in each HSCT. This methodology yielded a total of 93 wards. The number of wards within each HSCT eligible to participate in the *Happy Smiles Oral Health Programme* under 20% most deprived wards at Health and Social Care Trust Level methodology are; BHSCT 14 wards, NHSCT 27 wards, SEHSCT 18 wards, SHSCT 16 wards and WHSCT 18 wards.

The methodology of 20% most deprived wards at Northern Ireland Level was applied to select the number of wards that should be included. This methodology yielded a total of 92 wards. The number of wards within each HSCT eligible to participate in the *Happy Smiles Oral Health Programme* under 20% most deprived wards at Northern Ireland Level methodology are; BHSCT 21 wards, NHSCT 14 wards, SEHSCT 8 wards, SHSCT 17 wards and WHSCT 32 wards.

A change in the methodology for eligible wards from 20% most deprived wards at Health and Social Care Trust Level to 20% most deprived wards at Northern Ireland Level results in an increase of 7 wards in BHSCT, 1 ward in SHSCT and 14 wards in WHSCT, it results in a decrease of 13 wards in NHSCT and 10 wards in SEHSCT. Details of eligible wards in each HSCT under each methodology can be found in Appendix C.

Under the current methodology of 20% most deprived wards at Health and Social Care Trust Level, NHSCT and SEHSCT which have a lower proportion of the most deprived wards in Northern Ireland within their Trust boundaries have wards which have higher Multiple Deprivation Measure Rank (less deprived) which are eligible to participate in the *Programme.* BHSCT, SHSCT and WHSCT which have a higher proportion of the most deprived wards in Northern Ireland within their Trust boundaries have wards with lower Multiple Deprivation Measure Rank (more deprived) which are not eligible to participate in the *Programme.*

Changing the application of the methodology for identification of eligible wards for participation in the programme from 20% most deprived wards at Health and Social Care Trust Level to 20% most deprived wards at Northern Ireland Level would result in the *Happy Smiles Oral Health Programme* targeting the correct locations in each Health and Social Care Trust and Northern Ireland as a whole to target preventative activities in the most deprived locations.

Table 12: Comparison of Eligible Wards using 20% Most Deprived Wards at Health and Social Care Trust Level Methodology and 20% Most Deprived Wards at Northern Ireland Level Methodology

HSCT	Number of Wards	Number of Eligible Wards 20% Most Deprived Wards at Health and Social Care Trust Level Methodology	Number of Eligible Wards 20% Most Deprived Wards at Northern Ireland Level Methodology	Change Moving from 20% Most Deprived Wards Each HSCT to 20% Most Deprived Wards Northern Ireland Methodology.
BHSCT	69	14	21	+7
NHSCT	134	27	14	-13
SEHSCT	89	18	8	-10
SHSCT	80	16	17	+1
WHSCT	90	18	32	+14
Total	462	93	92	-1

Facilities

There are 735 facilities in Northern Ireland providing funded pre-school education, split across the five HSC Trusts:

Table 13: Number of facilities providing funded pre-school education in each HSCT.

HSCT	Facilities providing funded pre-school education
BHSCT	112
NHSCT	178
SEHSCT	135
SHSCT	172
WHSCT	138
Total	**735**

The methodology of 20% most deprived wards at Health and Social Care Trust Level was applied to select the number of facilities in Northern Ireland providing funded pre-school education that should be included in each HSCT. This methodology yielded a total of 190 facilities. The number of facilities providing funded pre-school education within each HSCT eligible to participate in the *Happy Smiles Oral Health Programme* under 20% most deprived wards at Health and Social Care Trust Level methodology are; BHSCT 34 facilities, NHSCT 41 facilities, SEHSCT 39 facilities, SHSCT 44 facilities and WHSCT 32 facilities.

The methodology of 20% most deprived wards at Northern Ireland Level was applied to select the number of facilities in Northern Ireland providing funded pre-school education that should be included in each HSCT. This methodology yielded a total of 194 facilities. The number of facilities providing funded pre-school education within each HSCT eligible to participate in the *Happy Smiles Oral Health Programme* under 20% most deprived wards at Northern Ireland Level methodology are; BHSCT 48 facilities, NHSCT 18 facilities, SEHSCT 22 facilities, SHSCT 49 facilities and WHSCT 57 facilities.

A change in the methodology for eligible wards from 20% most deprived wards at Health and Social Care Trust Level to 20% most deprived wards at Northern Ireland Level results in an increase of 14 pre-school facilities in BHSCT, 5 pre-school facilities in SHSCT and 25 pre-school facilities in WHSCT. However, it results in a decrease of 23 pre-school facilities in NHSCT and 17 pre-school facilities in SEHSCT eligible to participate in the *Programme*.

Under the current methodology of 20% most deprived wards at Health and Social Care Trust Level NHSCT and SEHSCT which have a lower proportion of the most deprived wards in Northern Ireland within their Trust boundaries have wards which have higher Multiple Deprivation Measure Rank (less deprived) which are eligible to participate in the *Programme* and therefore have pre-school facilities which have higher Multiple Deprivation Measure Rank (less deprived) which are eligible to participate in the *Programme.* BHSCT, SHSCT and WHSCT which have a higher proportion of the most deprived wards in Northern Ireland within their Trust boundaries have wards with lower Multiple Deprivation Measure Rank (more deprived) which are not eligible to participate in the *Programme* and therefore have pre-school facilities which have lower Multiple Deprivation Measure Rank (more deprived) which are eligible to participate in the *Programme*.

Changing the application of the methodology for identification of eligible wards for participation in the programme from 20% most deprived wards at Health and Social Care Trust Level to 20% most deprived wards at Northern Ireland Level would result in the *Happy Smiles Oral Health Programme* targeting the correct wards and correct pre-school facilities in each Health and Social Care Trust and Northern Ireland as a whole to target preventative activities in the most deprived locations.

Table 14: Comparison of Eligible Facilities using 20% Most Deprived Wards at Health and Social Care Trust Level Methodology and 20% Most Deprived Wards at Northern Ireland Level Methodology

HSCT	Number of Facilities	Number of Eligible Facilities 20% Most Deprived Wards at Health and Social Care Trust Level Methodology	Number of Eligible Facilities 20% Most Deprived Wards at Northern Ireland Level Methodology	Change Moving from 20% Most Deprived Wards Each HSCT to 20% Most Deprived Wards Northern Ireland Methodology.
BHSCT	112	34	48	+14
NHSCT	178	41	18	-23
SEHSCT	135	39	22	-17
SHSCT	172	44	49	+5
WHSCT	138	32	57	+25
Total	**735**	**190**	**194**	**+4**

Discussion:

Evaluation of the facilities participating in the *Happy Smiles Oral Health Programme* indicates that the targeted approach for the pre-school facilities in the 20% most deprived wards in each Health and Social Care Trust in Northern Ireland has not been applied. There is a need for a service specification to be introduced for the *Programme* clearly defining the eligibility criteria for identifying target wards within each Health and Social care trust and subsequent targeting of funded pre-school facilities within each HSCT.

Evaluation of questionnaire and semi-structured interviews with HSCTs identified common trends across all five Health and Social Care Trusts for key barriers and facilitators that impact on the implementation of the *Programme*. There were areas of good practice that could be used to inform the development of the service specification and feedback from the HSCTs will help shape the delivery of the *Programme* moving forward.

Evaluation of the Educational Facilities Questionnaire identified that there is a training need for pre-school facility staff that is being missed in some Trusts, this information has been presented to HSCTs to identify opportunities to engage with and facilitate training of staff in the facilities involved in the *Happy Smiles Oral Health Programme.* The feedback from the pre-school facilities will again help shape the recommendations, service specification and delivery of the *Programme* in the future.

Evaluation of the oral health data has mixed results for the impact the programme has had on the oral health of children in Northern Ireland. Overall the oral health of children in Northern Ireland has improved following the implementation of the *Happy Smiles Programme.* However, the programme does not have validated outcome measures such as population based individual child level data on *Happy Smiles* interventions linked to dental survey data to form a longitudinal cohort similar to that used to evaluate *Childsmile* oral health improvement programme in Scotland.[28] Validated measures would be required to show outcomes linked to the programme. We therefore must look to available evidence in the literature. *Childsmile* oral health improvement programme in Scotland shows that nursery toothbrushing has a strong association with reduced odds of caries and has the greatest impact among children in areas of high deprivation.[28]

Recommendations

Happy Smiles Oral Health Programme development

- Develop a service specification for *Happy Smiles Oral Health Programme* which clearly defines the standards of care expected from facilities funded to provide the *programme* as well as outlining the eligibility criteria for identifying target wards and target funded pre-school facilities within wards in each HSCT.

Training and Resources

- Develop regional training resources and complete training of Community Dental Service staff on *Happy Smiles Oral Health Programme.*
- Develop regional training resources for use by Community Dental Services when training facilities to participate in the *Happy Smiles Oral Health Programme.*
- Develop a regional, shared resource for the educational elements linking the programme to the pre-school curriculum

Regional Working group

- Establish a regional working group with representatives from each Trust, SPPG and DOH

Targeting

- Review the current eligibility criteria for targeting settings, with consideration given to targeting based on 20% most deprived wards at Northern Ireland Level rather than Trust level.
- Exploration of other targeting approaches including proportion of children in receipt of free school meals in each facility.
- Consider expansion of eligibility criteria to include primary 1 and primary 2 children as per recommendation in Northern Ireland Children's Oral Health Improvement Plan 2023.[13]

Funding

- Review the costs (staffing and materials) to provide *Happy Smiles Oral Health Programme* in light of feedback that the funding was made to legacy Trusts, is not currently identifiable in the current HSC Trust's financial base lines and has not been uplifted.
- Future business cases should ensure funding allocation for each Health and Social Care Trust is proportionate to service provision which should be based on the target cohort of facilities participating in each HSCT.

Evaluation

- Develop a monitoring and evaluation structure similar to that of *Designed to Smile* Wales.[29]
- Annual monitoring of *Happy Smiles Oral Health Programme* should be completed and published.

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