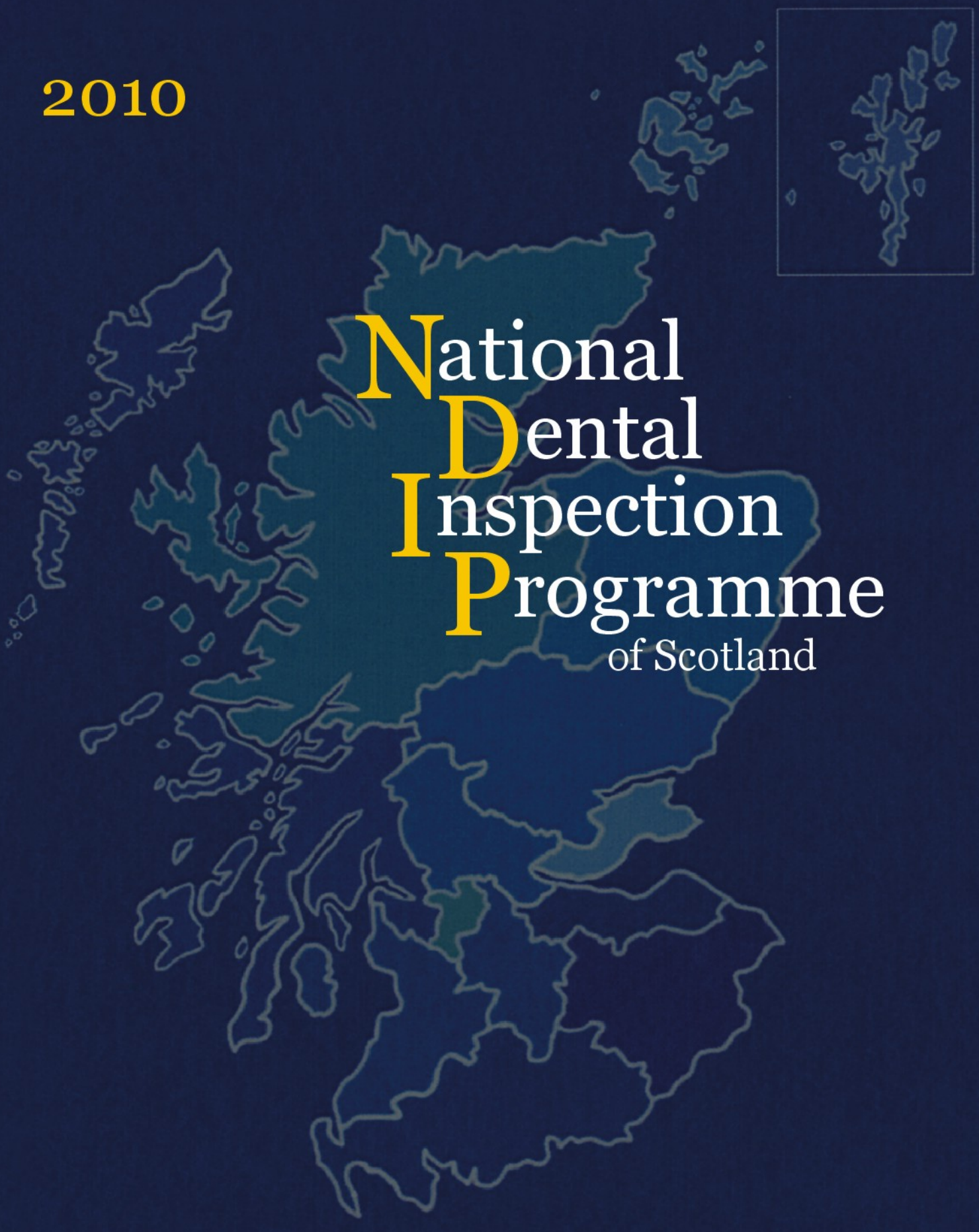
2010



National Dental Inspection Programme of Scotland

Report of the National Dental Inspection Programme on the detailed inspection of **P1 Children** and the basic inspections of P1 & P7 throughout Scotland during the school year 2009/2010 prepared for the Scottish Dental Epidemiological Co-ordinating Committee

National Dental Inspection Programme of Scotland

Report of the 2010 Survey of P1 Children

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The 2010 National Dental Inspection Programme (NDIP)
undertaken in the school year 2009/2010

It is important that every child's dental wellbeing is assessed so that children and their parents/carers can maintain oral health and take necessary steps to remedy any problems that may have arisen. There is also a need to monitor children's dental health at national and regional levels so that reliable oral health information is available for planning and evaluating initiatives directed towards improvements.

The National Dental Inspection Programme (NDIP) aims to fulfil these functions by providing an essential source of information for keeping track of any changes in the dental health of children in Scotland. When combined with the full historical nature of the existing data bank gathered from 1987 by the Scottish Health Boards' Dental Epidemiological Programme (SHBDEP)[1], NDIP can identify trends and assist in planning dental services.

Two key child age groups are targeted: i) at entry into Local Authority schools in primary one (P1) and ii) in primary seven (P7) before the move to secondary education. The Inspection Programme has two levels: a *Basic Inspection* (intended for all P1 and P7 children) and a *Detailed Inspection* (where a representative sample of either the P1 or the P7 age group is inspected in alternate years). In the school year 2009/2010, the main focus of the *Detailed Inspection* programme was P1.

Dental health of P1 children in Scotland in 2010

At the beginning of their primary school career, 64% of P1 children in Scotland were found to have no obvious dental decay experience in their deciduous teeth (compared to 58% in the P1 survey of 2008[2]). Overall, the results for the 2009/2010 cohort have exceeded the national target of 60% with no obvious decay experience set for this age group by the Scottish Government, with 12 NHS Boards reaching or exceeding this mark. This is an improvement on the 2008 survey of six percentage points.

In 2010, the mean $d_3$mft in Scotland has decreased to 1.52 (1.86 in 2008), with the percentage of P1 children across Scotland having obvious decay experience reducing to 36%, compared to 42.3% in 2008.

As found in most human diseases, there is a gradient across society. The majority of dental disease continues to be borne by children from more deprived backgrounds, with only 45% of P1 children in the most deprived tenth of the population having no obvious caries experience compared to 81.5% of those in the most affluent decile.

In 2002, the Scottish Executive consultation document 'Towards Better Oral Health in Children'[3] stated, *"Despite some significant improvements, we still have unacceptably poor levels of oral health. Scotland's children still have too many diseased teeth. Dental disease still results in extreme pain and discomfort, infection, social embarrassment and interrupted work and education for a significant part of the Scottish population"*. Since 2005, the Scottish Government has supported a number of comprehensive dental public health and targeted clinical initiatives for young children under the collective programme name of Childsmile. These initiatives now seem to be bringing about improvements in the oral health of young children.

Principal aims of the NDIP Programme in 2010

The principal aims are to gather appropriate information in order to inform children and parents/carers of the dental/oral health status of the child and, through appropriately anonymised, aggregated data, advise the Scottish Government, NHS Boards and other organisations concerned with children's health of the oral disease prevalence in their area.

The 2010 NDIP work took place across all areas of Scotland and involved the collaboration of many people and organisations, including the Consultants in Dental Public Health and Chief Administrative Dental Officers Group, the Scottish Association of Community Dental Directors, Community Dental Officers, Scottish NHS Boards, Local Education Authorities and schools, the Community Oral Health Section of Glasgow Dental School, University of Glasgow, and the Information Services Division of NHS National Services Scotland.

What does the NDIP Basic Inspection consist of?

The *Basic Inspection* involves a simple assessment of the mouth of each child using a light, mirror and ball-ended probe. The dental status found in each child is then placed into one of three categories depending on the level of dental health and the treatment need, and a letter sent to the parents/carers.

One of three letters is sent to parents/carers informing them of the state of dental health observed in the mouth of their child at the time of the school inspection (these letters vary slightly depending on whether a P1 or a P7 child has been inspected). The letters are as follows:

- Letter A - should seek immediate dental care on account of severe decay or abscess.
- Letter B - should seek dental care in the near future due to one or more of the following: history of tooth decay, a broken or damaged front tooth, tooth wear, poor oral hygiene or may require orthodontics.
- Letter C - no obvious decay experience but should continue to see the family dentist on a regular basis.

The results of the *Basic Inspection* are then anonymised and aggregated. They are used to monitor the impact of local and national oral health improvement programmes, and to assist in the development of local dental services. More information regarding the data from the NDIP *Basic Inspection* can be seen in Part 2 of this report on page 17.

What does the NDIP Detailed Inspection consist of?

The *Detailed Inspection* is a more rigorous and comprehensive assessment that involves recording the status of each surface of each tooth in accordance with international epidemiological conventions.

The specific goals of the *Detailed Inspection* are to determine current levels of established tooth decay, and to determine the impact of deprivation on the dental health of primary one children in Scotland in 2010.

The remainder of this section of the Report gives the results for the *Detailed Inspection* in the school year 2009/2010, while the results for the *Basic Inspection* can be found at the end of this document.

The results shown in this report have been weighted for each NHS Board by deprivation quintile [Scottish Index of Multiple Deprivation (SIMD) 2009].

How was consistency achieved in the conduct of the inspections across Scotland?

An important part of the NDIP process is that the conduct of the *Detailed Inspections* should remain consistent with key elements of the previous SHBDEP system all over Scotland and that the participating, specially trained salaried dentists record their findings in the same manner. In order to ensure this, the dentists are required to undergo training and calibration exercises before the programme begins.

Mandatory two-day training courses took place in Edinburgh in November 2009 consisting of illustrated lectures, IT training and discussion sessions on how to record the inspections, in accordance with criteria set down by the British Association for the Study of Community Dentistry (BASCD)[4], appropriately modified for the National Dental Inspection Programme (NDIP).

These were followed by clinical training sessions using P1 children from two local primary schools. When training was completed, the dentists conducted a series of calibration assessments on a further group of schoolchildren. The results were compared so that only dentists falling inside the range of 'substantial agreement'[5] were allowed to participate in the *Detailed Inspections*.

How many P1 children had a Detailed Inspection?

Each NHS Board was required to identify the number of Local Authority (LA) schools needed to obtain a representative sample of a given size from their primary one population[6]. The sample sizes used provided adequate numbers to allow meaningful comparisons between NHS Boards. The sampling procedure for NDIP differs from the previous SHBDEP surveys in so far as whole classes are now selected to simplify the process for schools while ensuring that results reflect the P1 population (or P7 population) in Scotland.

Table 1 shows that 12,716 children from Local Authority Schools across Scotland were inspected in detail. This represents 23% of the P1 population in Local Authority schools. Across all NHS Boards, the percentage of P1 children inspected ranged from 12% to 96%.

NHS Boards can choose to increase the sample size to aid local planning needs, whilst some less populated Boards need to include large proportions to achieve statistically meaningful results. In the course of the survey, 10% of the children were re-inspected so that the consistency of the examination results of dentists undertaking the inspections could be assessed.

Table 1 : Primary 1 population and the number who received a Detailed Inspection by NHS Board across Scotland

NHS Board	Primary 1 populations	Number of P1 children receiving a *Detailed Inspection*	% of P1 population receiving a *Detailed Inspection*
Ayrshire & Arran	3,840	1,073	27.9
Borders	1,215	331	27.2
Dumfries & Galloway	1,420	329	23.2
Fife	3,909	704	18.0
Forth Valley	3,216	749	23.3
Grampian	5,531	694	12.5
Greater Glasgow & Clyde	12,689	4,326	34.1
Highland	3,178	1,137	35.8
Lanarkshire	6,470	773	11.9
Lothian	8,537	1,212	14.2
Orkney	192	174	90.6
Shetland	245	234	95.5
Tayside	4,102	769	18.7
Western Isles	281	211	75.1
Total for Scotland	**54,825**	**12,716**	**23.2**

When were the Dental Inspections carried out and how old were the children inspected?

The NDIP inspections took place from November 2009 until June 2010. The staff of the Community Dental Service within each NHS Board undertook all the clinical work associated with both the *Basic* and *Detailed Inspections.*

The average age of the children examined was 5.5 years of age – this is the same value as recorded in both 2006 and 2008. The mean age for girls was 5.5 while the mean age for boys was 5.6. The range of ages across Scotland was 4.0 –7.0 years.

What is meant by 'obvious decay' in this report?

It is important to note that when obvious tooth decay (d_3t) is discussed in this report it means *decay that can be seen to go into the dentine* (i.e. the layer below the outer white enamel of the deciduous or first teeth), and includes

pulpal decay (i.e. decay into the pulp). The *Detailed Inspection* measures obvious decay into dentine when seen under school (rather than dental surgery) conditions.

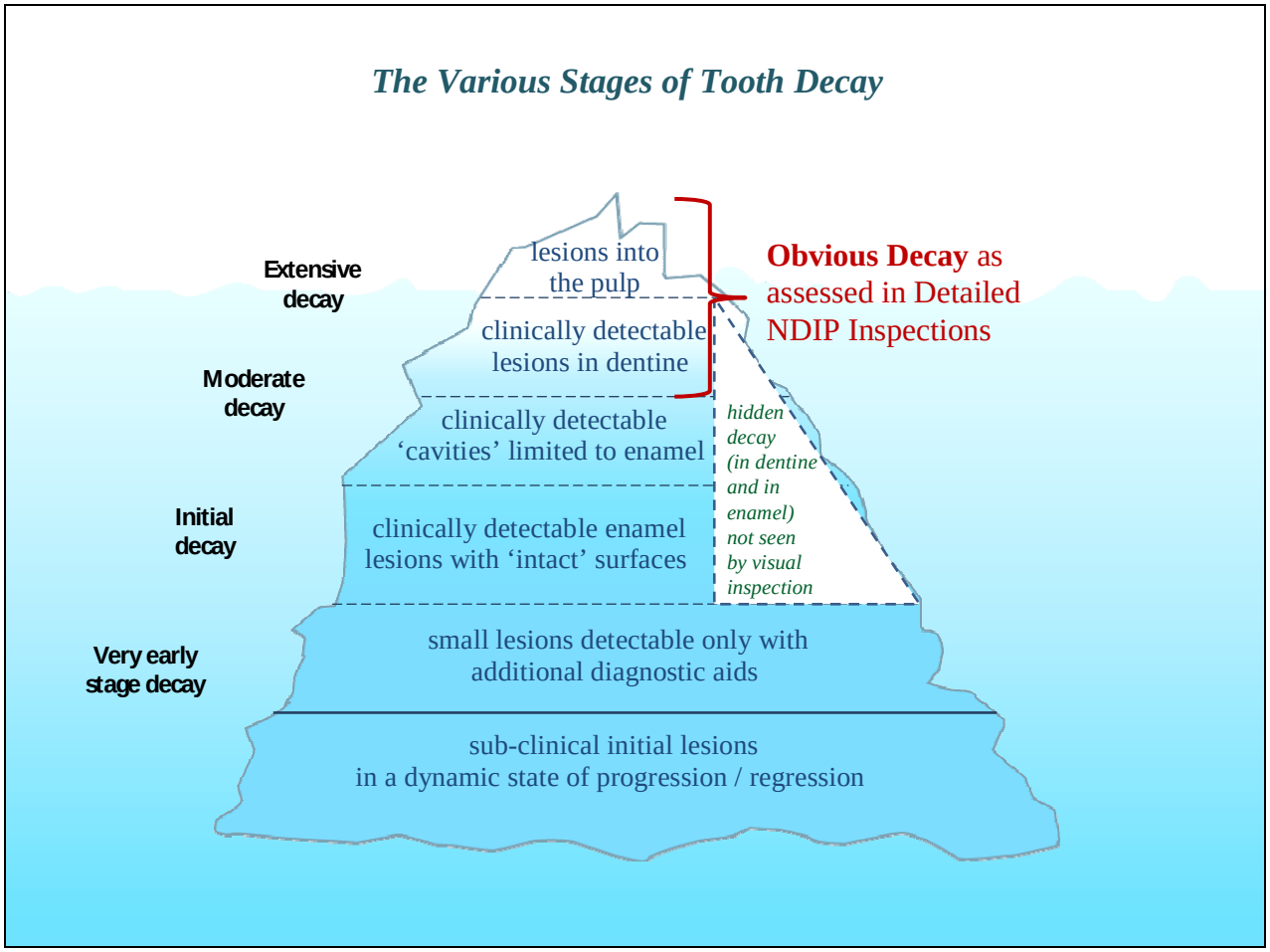
What is meant by 'obvious decay experience' in this report?

When the term obvious decay experience ($d_3$mft) is discussed in this report it means 'obvious decay' (noted above), and in addition includes both missing teeth (extracted due to decay) and filled teeth.

What are the stages of tooth decay?

Dentists use specific professional terms to identify the different stages of tooth decay. However, simpler terms are provided in Diagram 1 below to help illustrate the various stages of tooth decay.

Diagram 1



What definitions of decay do the dentists conducting the NDIP Detailed Inspection use?

The definitions of decay used are in accordance with the BASCD guidelines and international epidemiological conventions, thus allowing comparisons to be made with other countries in Europe and beyond.

The data presented for decay relate only to dental decay that clinically appears to have penetrated dentine (the inside of the tooth). This is a different diagnostic level from that used by many dentists when examining patients in a dental surgery, i.e. dental check-ups.

National Dental Inspection Programme (NDIP) 2010

PART 1

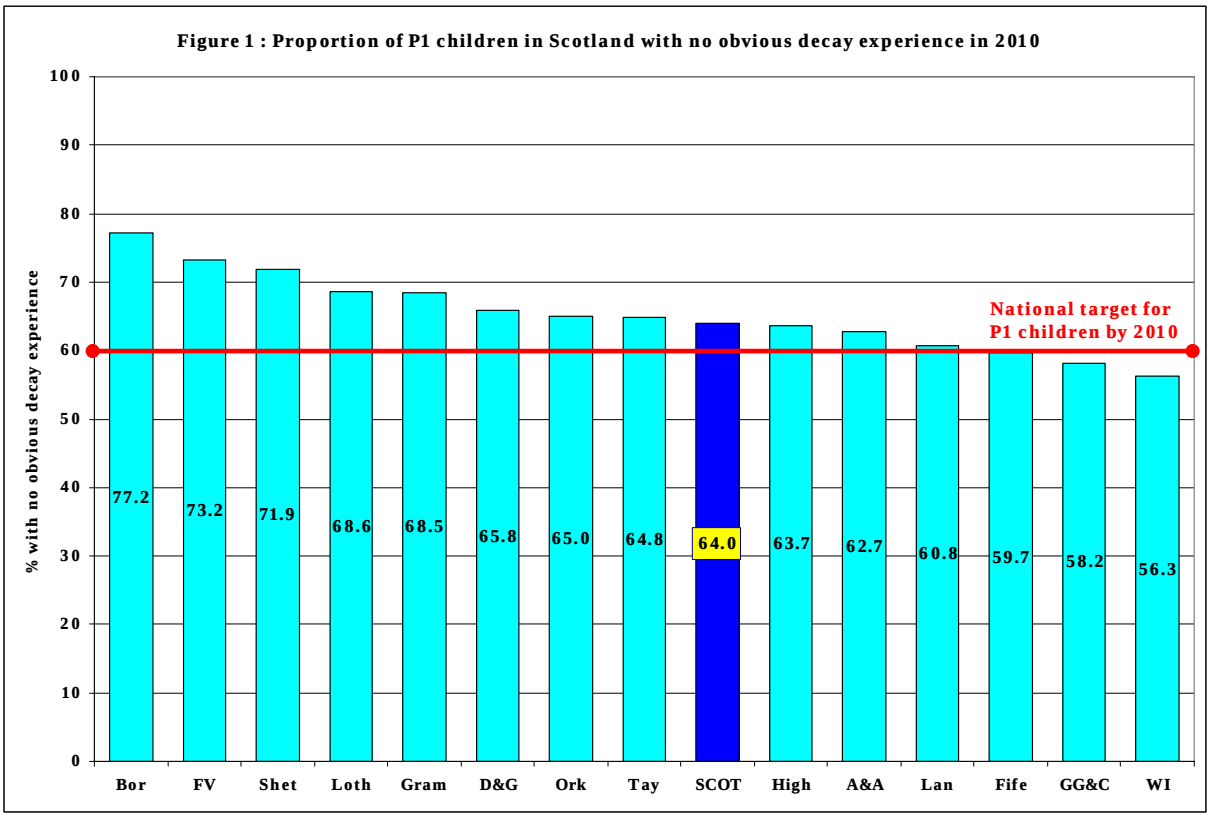
DETAILED INSPECTION RESULTS

What proportion of P1 children in Scotland had no obvious decay experience in 2010?

One of the dental targets set by the then Scottish Executive in 1999[7] was that at least 60% of P1 children should be free of obvious decay experience by the year 2010.

Figure 1 shows the proportion of P1 children in NHS Boards who showed no signs of obvious decay experience in their deciduous (or first) teeth. Across Scotland, 64.0% of P1 children fall into this category, with a range of 56.3% to 77.2% across the fourteen NHS Boards.

These findings illustrate that, on rounding up to whole numbers, 12 NHS Boards have achieved the 2010 target and how close the other two NHS Boards are to achieving the target.



The level for Scotland of 64.0% with no obvious decay experience is a benchmark figure against which future P1 *Detailed Inspection* results will be measured and is a major improvement over the 2008 P1 NDIP Report, where the figure for Scotland was 57.7%.

The level for Scotland of 64.0% is the highest recorded proportion of P1 children with no obvious decay experience in their deciduous teeth at any time since dental surveys of this type began in 1988.

What levels of obvious decay experience were seen in P1 children in 2010?

It is important to note that, although the average number of obviously decayed, missing and filled teeth across all primary one children examined in Scotland was 1.52, for the 36% of these children who had experienced dental decay, the average number of affected teeth was between two and three times this figure at 4.19, compared with the value of 4.39 found in the 2008 survey.

The mean $d_3$mft for P1 males was 1.60 (comprising d_3t: 1.08, mt: 0.32 and ft: 0.20) while that for P1 females was 1.46 (0.98, 0.29 and 0.20 respectively).

A more detailed picture of the decay experience results is presented in Table 2.

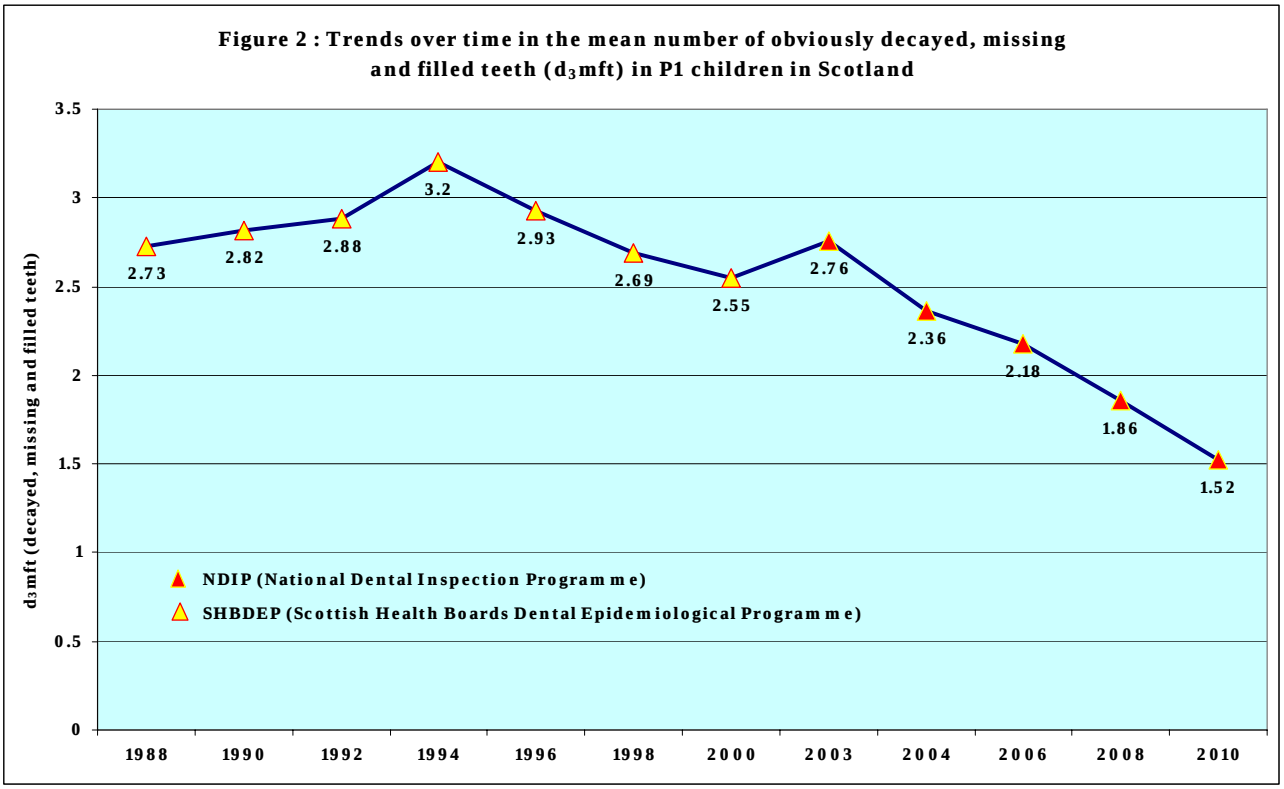
Table 2 : Overall obvious decay experience in deciduous teeth of P1 children in Scotland

	%	NHS Boards
Free of obvious decay experience at the dentinal level ($d_3$mft = 0)	64.0	56.3 – 77.2
With obvious decay experience, $d_3$mft>0 (as per BASCD)	36.0	22.8 – 43.7
With 'current decay', d_3>0 (as per BASCD)	28.9	18.1 – 37.1
Care index (ft/$d_3$mft)	12.5	8.4 – 26.5
	Mean	**NHS Boards**
Obvious decay experience ($d_3$mft) across Scotland	1.52	0.91 – 1.85
Decayed teeth (d_3t) across Scotland	1.00	0.66 – 1.31
Missing teeth (mt) across Scotland	0.33	0.06 – 0.51
Filled teeth (ft) across Scotland	0.19	0.09 – 0.41
Decayed, missing and filled teeth for those with obvious decay experience ($d_3$mft>0)	4.19	3.28 – 4.63

How has the dental health of P1 children in Scotland changed over time?

The changes over time in the mean number of decayed, missing and filled deciduous teeth are shown in Figure 2 and illustrate the marked decline over the last seven years. The value of 1.52 is the lowest level since data began to be collected in 1988.

Figure 2 : Trends over time in the mean number of obviously decayed, missing and filled teeth ($d_3$mft) in P1 children in Scotland



Similarly, the data in Figure 3 indicate a steady rise in the number of those with no obvious decay experience (i.e. a decline in the prevalence of decay). This 2010 NDIP Report on P1 children shows a continuing improvement in the proportion with good dental health.

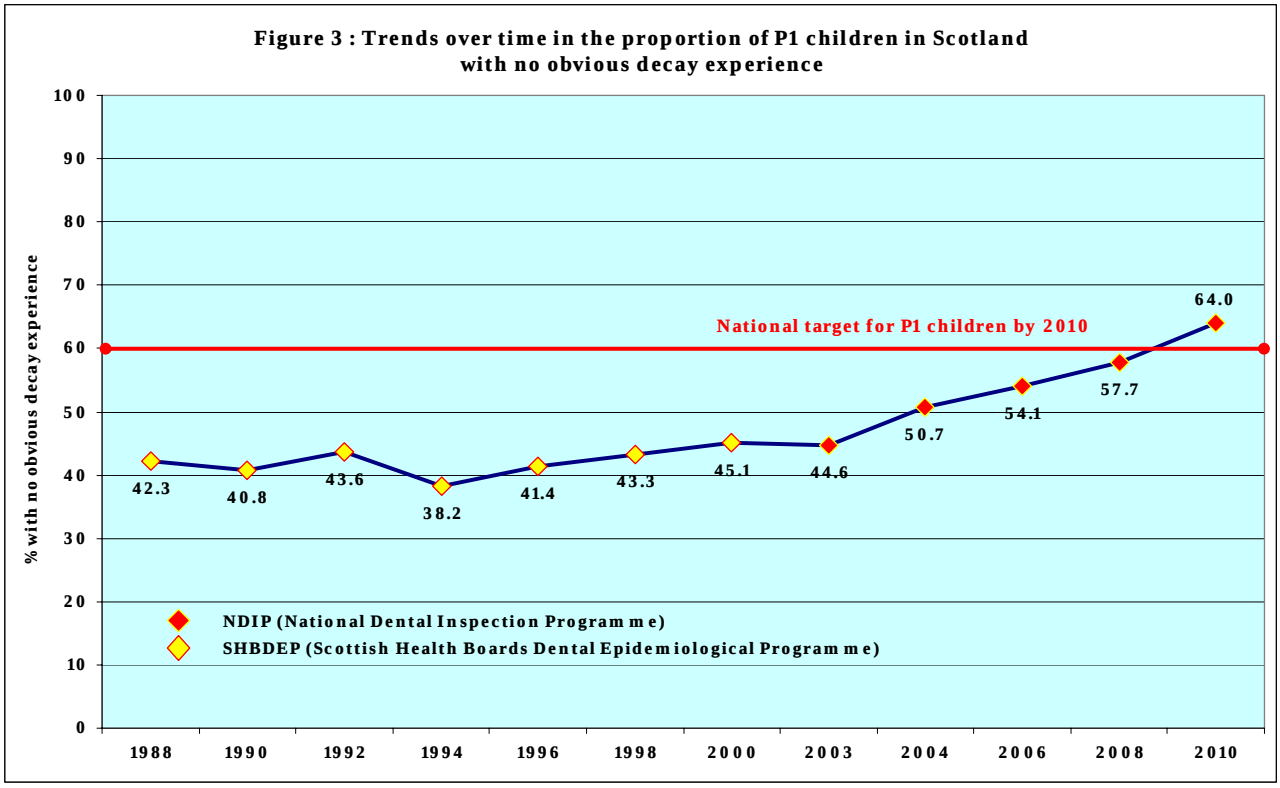
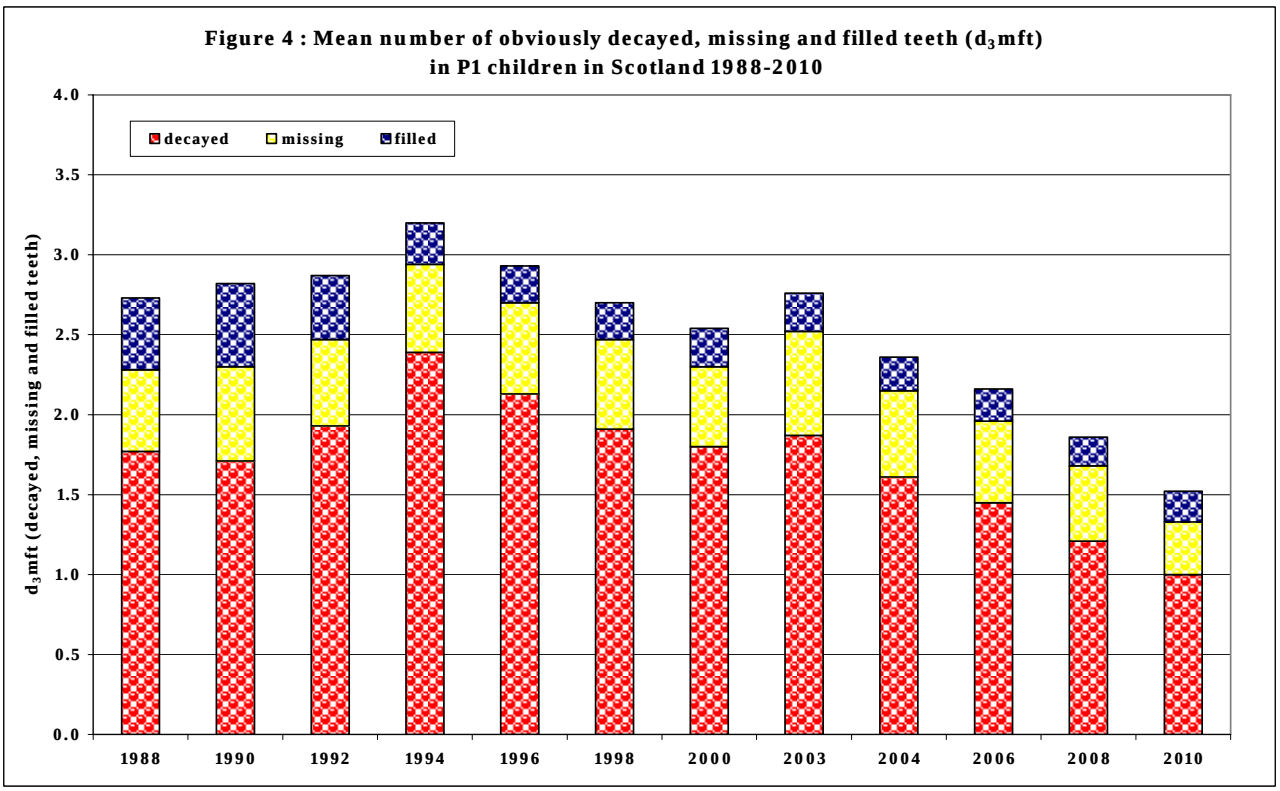


Figure 4 illustrates the changes that have occurred in the number of obviously decayed, missing and filled teeth (d_3mft) for P1 children in Scotland over the period 1988 to 2010.

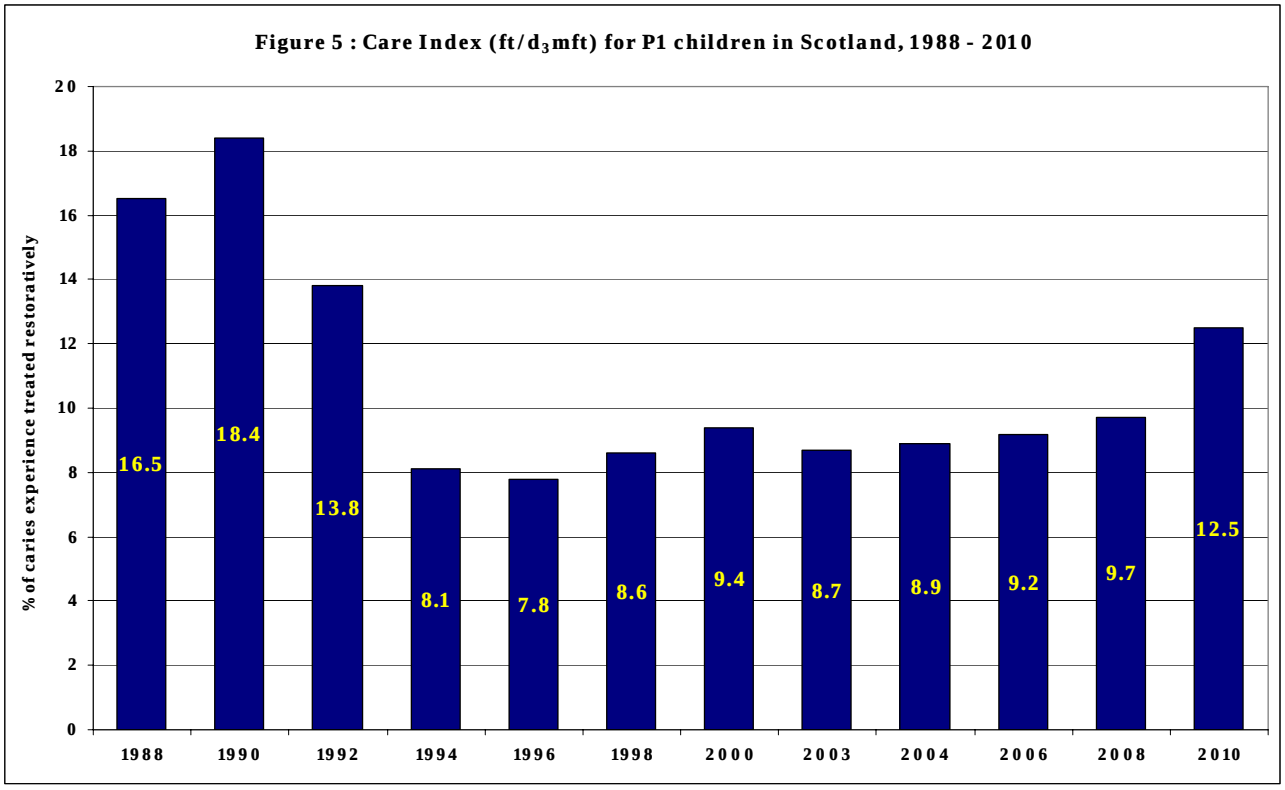


The importance of monitoring the dental health of children and being able to make comparisons over a long period of time is illustrated in Figure 4. By viewing the results as a series, rather than making year-on-year comparisons, the trend in the number of decayed, missing and filled teeth ($d_3$mft) can be seen. Since the 1990s, the largest reduction has been in the decayed component (d_3t).

What proportion of obvious decay experience among P1 children was treated with fillings?

The Care Index is used to describe the level of restorative care (the number of filled teeth divided by the number of obviously decayed, missing and filled teeth and multiplied by 100 [(ft/$d_3$mft) x 100]).

Figure 5 illustrates the changes in the Care Index over time. For Scotland as a whole, only 12.5% of teeth with decay experience have been filled, and there has been some concern expressed that a high level of unrestored decay may indicate a failure in primary dental care provision to this young age group.



While the level of NHS dental registration among children is improving, there are still children in P1 who are not registered with an NHS dental practice. However, the Scottish Government and NHS Boards continue to encourage improvement in this area and, since the recent (April 2010) change in regulations, the registration period of all patients registered with an NHS dentist is *non-time limited*. This means all existing patients and all new patients are registered for life, and registration arrangements no longer lapse after a set period.

Projects supported by the NHS in Scotland, including locally co-ordinated community health improvement programmes that promote children's dental registration, are encouraging parents/carers to seek and maintain professional dental care for very young children as part of a holistic approach to improving children's health. These initiatives, funded by the Scottish Government, include the promotion of toothbrushing with fluoride-containing toothpaste and healthy eating, together with the application of fluoride varnish to the teeth. They are collectively known as the Childsmile programme and are aimed at establishing a good preventive regime from an early age that will carry through into adulthood.

Was the prevalence of obvious decay experience distributed evenly throughout the population of P1 children?

The results shown in Table 3 demonstrate that decay experience was not distributed evenly throughout the P1 population. Some 36% of P1 children had 100% of the obvious decay experience while an unfortunate 8% had 50%

of the recorded decay experience. All of the teeth with severe decay into the pulp were seen in just 9% of the children inspected.

Table 3 : Skewed prevalence of obvious decay experience in the deciduous teeth of P1 children in Scotland

Proportion of P1 population		Share of the disease
		Established decay experience (d_3mft)
36% of the population	was observed to have	100% of the teeth with established decay experience
8% of the population	was observed to have	50% of the teeth with established decay experience
4% of the population	was observed to have	25% of the teeth with established decay experience
		Established decay (d_3t)
29% of the population	was observed to have	100% of the teeth with established decay
7% of the population	was observed to have	50% of the teeth with established decay
3% of the population	was observed to have	25% of the teeth with established decay
		Severe decay into the pulp
9% of the population	was observed to have	100% of the teeth with severe decay
2% of the population	was observed to have	50% of the teeth with severe decay
1% of population	was observed to have	25% of the teeth with severe decay

What are the obvious decay experience results in deciduous teeth of P1 children across Scotland?

Table 4 shows the results of the prevalence of decay for all 14 NHS Boards across Scotland and details the total obvious decay experience (decayed, missing and filled teeth [d_3mft]).

Table 4 : Obvious decay experience for each NHS Board in Scotland

NHS Board	% with no obvious decay experience in deciduous teeth	Mean no. of decayed, missing and filled deciduous teeth (d_3mft)	Mean no. of decayed deciduous teeth (d_3t)	Mean no. of missing deciduous teeth (mt)	Mean no. of filled deciduous teeth (ft)	For those with decay, the mean no. of decayed, missing and filled deciduous teeth ($d_3mft>0$)
Ayrshire & Arran	62.7	1.47	0.90	0.37	0.20	3.95
Borders	77.2	0.91	0.66	0.12	0.14	4.03
Dumfries & Galloway	65.8	1.54	1.25	0.16	0.13	4.63
Fife	59.7	1.60	0.93	0.51	0.17	4.04
Forth Valley	73.2	0.95	0.70	0.17	0.09	3.53
Grampian	68.5	1.30	0.92	0.23	0.15	4.14
Greater Glasgow & Clyde	58.2	1.85	1.31	0.33	0.20	4.41
Highland	63.7	1.44	0.98	0.24	0.22	3.95
Lanarkshire	60.8	1.77	1.08	0.49	0.20	4.58
Lothian	68.6	1.31	0.74	0.33	0.23	4.08
Orkney	65.0	1.17	0.77	0.09	0.31	3.28
Shetland	71.9	0.95	0.68	0.06	0.21	3.36
Tayside	64.8	1.59	1.00	0.33	0.26	4.32
Western Isles	56.3	1.64	1.16	0.07	0.41	3.75
All Scotland	64.0	1.52	1.00	0.33	0.19	4.19

What is the picture of dental health in the deciduous teeth of P1 children across Scotland?

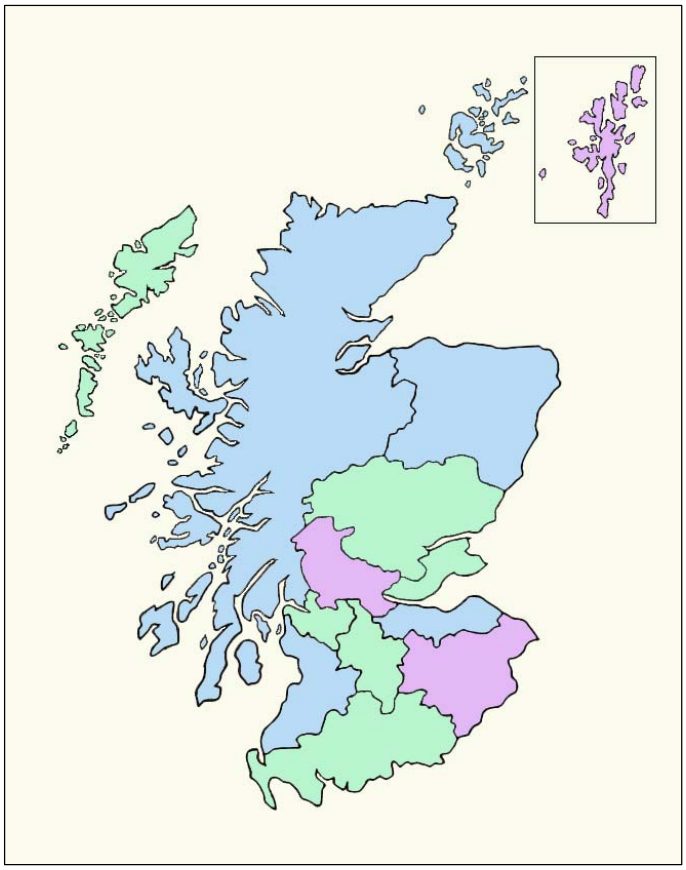


Figure 6:

Obvious decay experience (d_3mft) in deciduous teeth of P1 children in Scotland by NHS Board

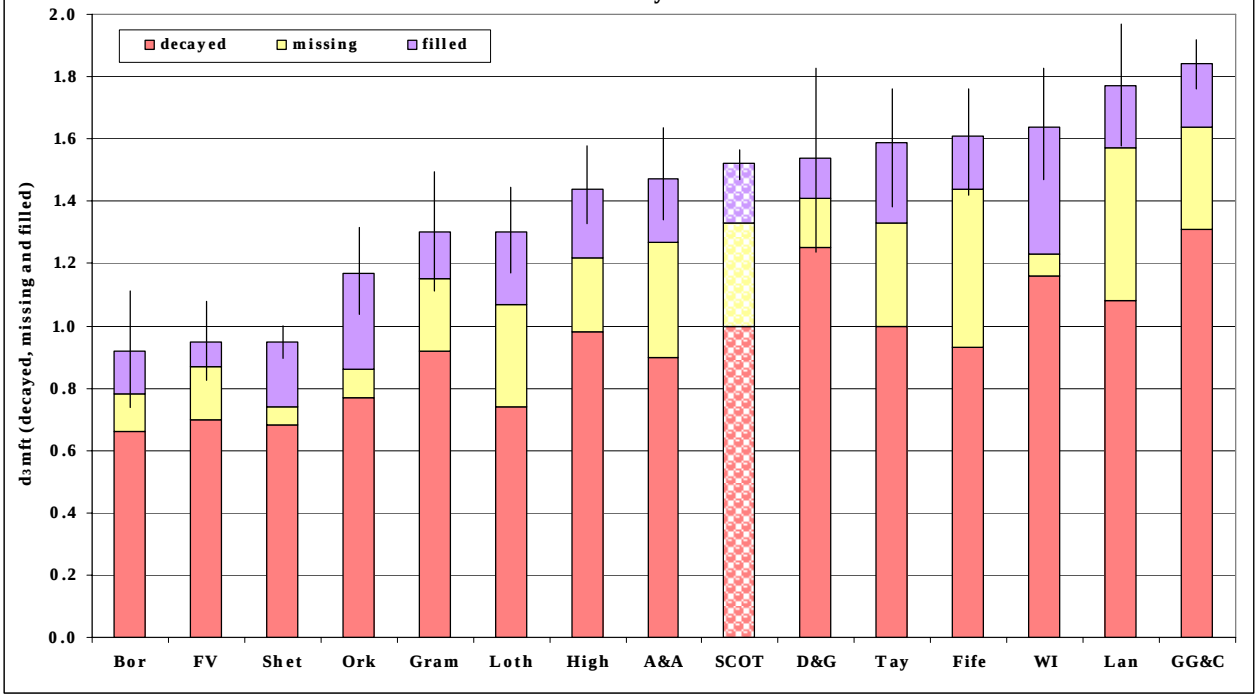
Mean number of decayed, missing and filled teeth (d_3mft)

< 1.0
1 – 1.5
>1.5

Figure 6 illustrates the mean level of obvious decay experience in deciduous teeth of P1 children across Health Boards in Scotland. This illustrates the variation in the dental health that exists in this age group across the country.

The amount of obvious decay experience among P1 children for each of the NHS Boards in Scotland can be viewed in Figure 7.

Figure 7 : Mean number of obviously decayed, missing and filled teeth (d_3mft) in Scotland and by NHS Board



The results in Figure 7 show the average number of decayed, missing and filled teeth for each P1 child for the fourteen NHS Boards across Scotland and that for Scotland as a whole. The mean obvious decay experience in the deciduous dentition of children in this age group varies between different areas: for example, the average score for children in Greater Glasgow and Clyde is approximately twice the average score in Borders.

However, the observed dental health in both Lanarkshire and Greater Glasgow and Clyde, i.e. those NHS Boards with the highest average number of decayed, missing and filled teeth, has improved when compared to the 2008 NDIP Survey.

The vertical lines in Figure 7 indicate the 95% confidence limits associated with each value and illustrate the limited extent to which the figure can be interpreted as a "league table". While there is a statistically significant difference between those NHS Boards at the extreme left of the figure and those on the right, it would be unwise to ascribe too much importance to minor variation in the exact ranking positions of NHS Boards whose results are in close proximity to one another.

What was the level of decay experience for those who had experienced obvious tooth decay?

The level of decay experience in these P1 children is shown in Figure 8.

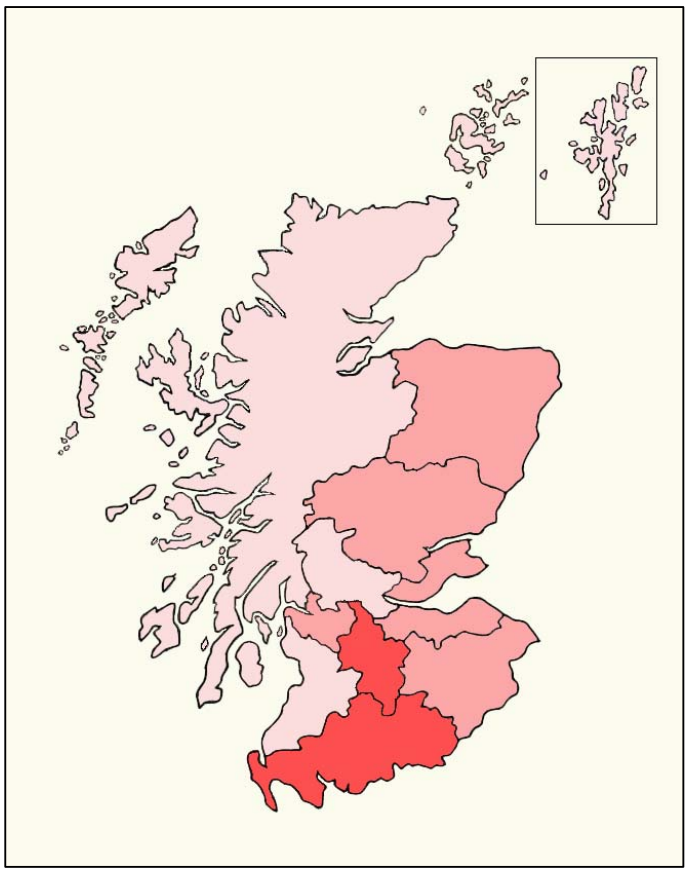


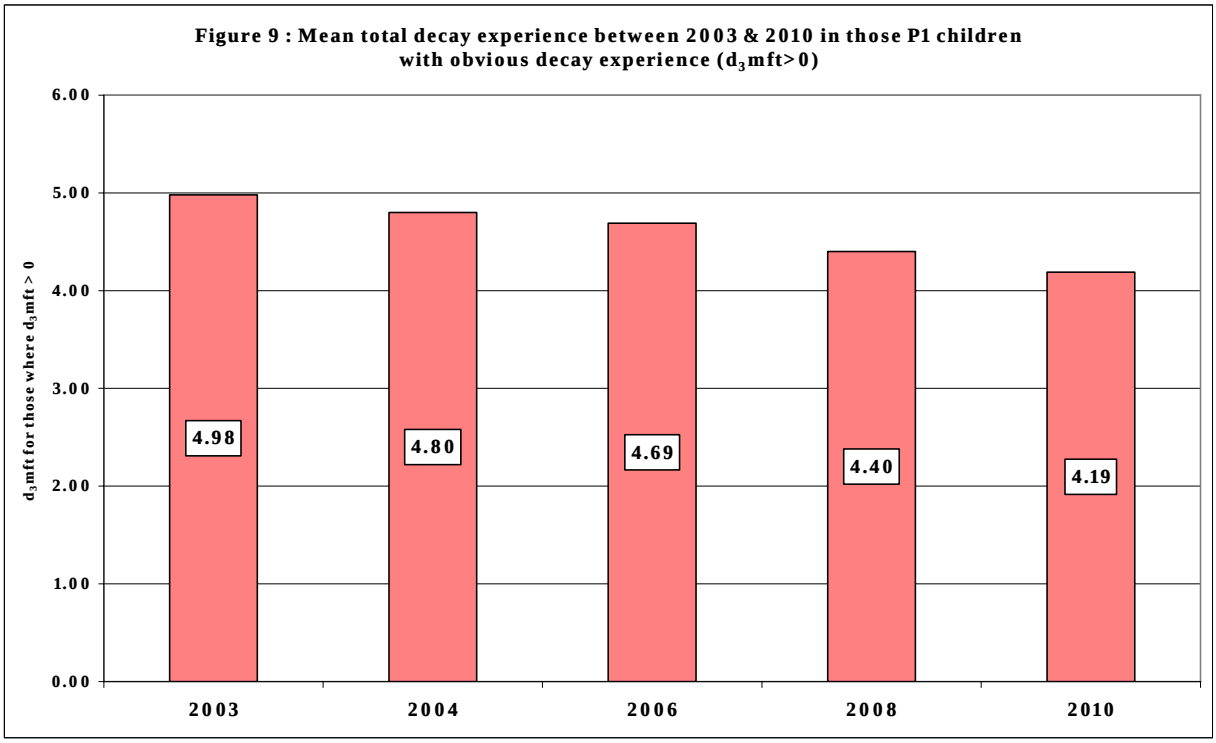
Figure 8:

Level of decay experience in deciduous teeth of P1 children for those with obvious decay experience ($d_3$mft for those where $d_3$mft>0)

In this 2010 survey, 36.0% of P1 children in Scotland had obvious decay experience in their deciduous teeth. For those children, the mean number of affected teeth was 4.2. This ranged across the 14 NHS Boards from 3.3 and 3.4 in Orkney and Shetland respectively up to 4.6 in Dumfries and Galloway and Lanarkshire (as detailed in Table 4).

Since the last survey of this age group was undertaken in 2008, there has been a reduction in the mean number of teeth affected. However, it remains of concern that such a high number of deciduous teeth have experienced decay at this age, and that the number of teeth affected at the individual child level ranged from one to 20 teeth.

When the mean total decay experience of those P1 children in Scotland with obvious decay experience ($d_3$mft>0) is examined over time, a continuing decrease in the amount of decay present in the mouth is observed. This decrease can be seen in Figure 9.



Is there a link between social deprivation and poor dental health among P1 children in Scotland?

All NDIP surveys on deprivation now report using, principally, the Scottish Index of Multiple Deprivation (SIMD)[8], rather than the deprivation category (DepCat)[9] used previously. The SIMD classification identifies small area concentrations of multiple deprivation and is presented at data zone level based on postcode unit information. It has seven domains (income, employment, education, housing, health, crime and geographical access) which have been combined into an overall index to rank relative multiple deprivation in all geographical areas throughout Scotland.

One of the SIMD classifications is based on quintiles of deprivation where quintile 1 is the most deprived and quintile 5 is the least deprived. Figure 10 illustrates the relationship between dental health and these quintiles.

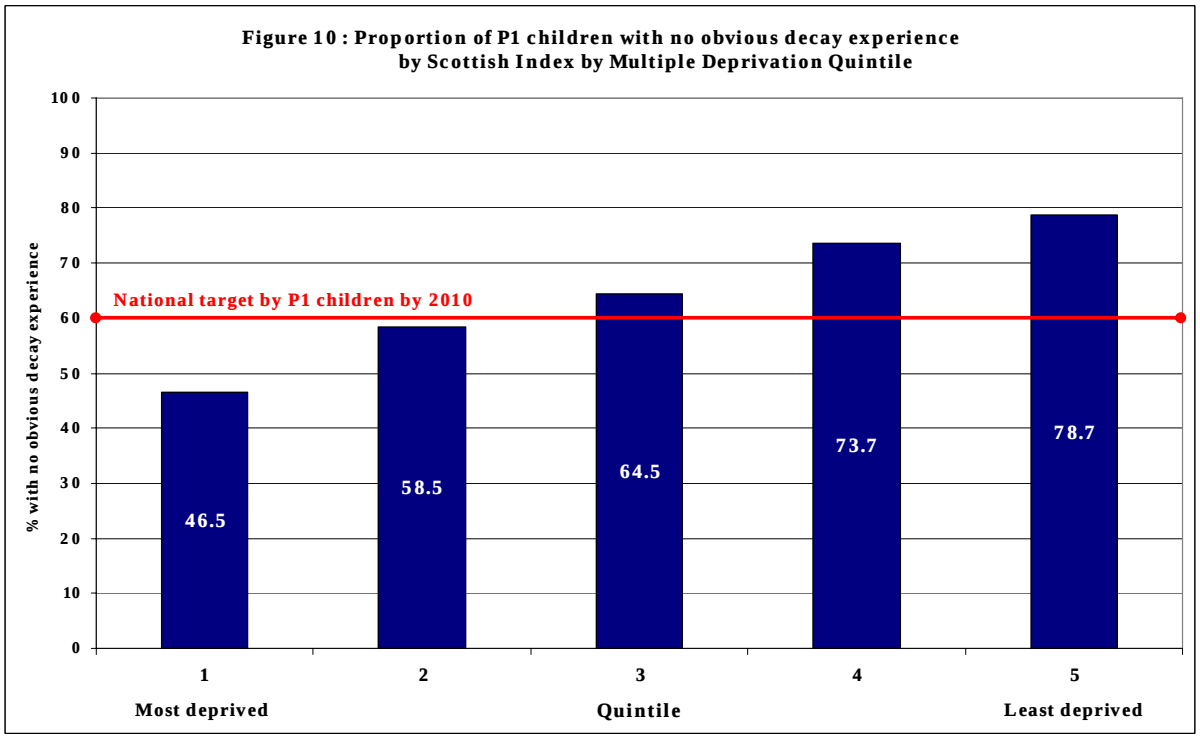


Figure 10 graphically illustrates the difference in dental health between P1 children in the different SIMD quintiles. Those in quintiles 3, 4 and 5 have reached the 2010 National Target of 60% with no obvious decay experience, while quintiles 1 and 2 - the most deprived areas - fell short, with only 46.5% of P1 children in quintile 1 having no obvious decay experience.

It was possible to attribute SIMD values to data for 98% of the 13,027 children who were examined in this *Detailed Inspection*. Complete postcode unit information was absent from two NHS Boards, incomplete for 11 NHS Boards and 100% complete in only one NHS Board.

The SIMD decile classification has 10 divisions of deprivation from 1 (most deprived) to 10 (least deprived) and the results for 2008 and 2010 are shown in Figure 11.

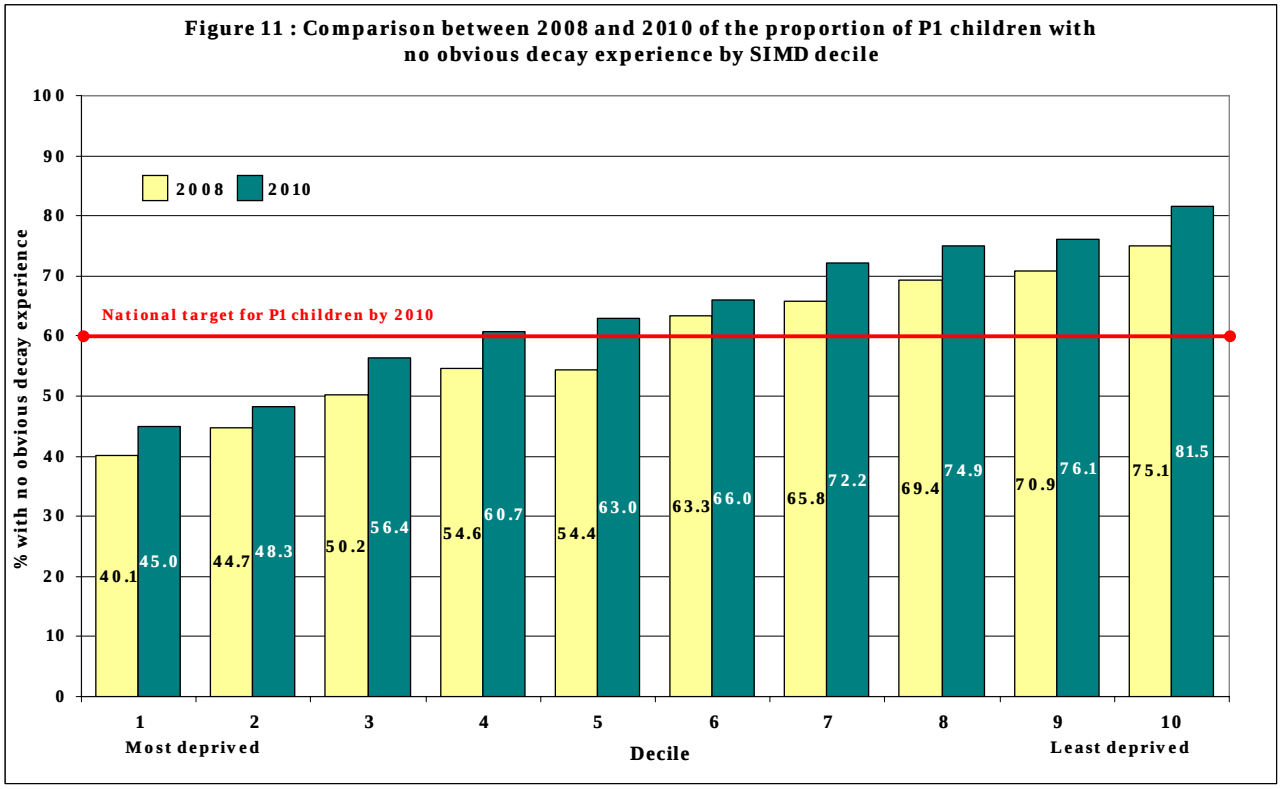


Figure 11 shows that, in the most recent survey, only the three most deprived deciles had not reached the 2010 target of 60% with no obvious decay experience. It also shows that there was an improvement in oral health across all deciles between 2008 and 2010.

As SIMD data are being used for only the second time in the series of NDIP P1 reports, only limited information on trends over time is available using this measure. The DepCat data reported in the previous eight epidemiological dental surveys of P1 children across Scotland, together with those obtained in 2010, are detailed in the Appendix (Figure 14).

What do the findings of this 2010 NDIP Detailed Inspection Report show?

The 2010 Report presents the findings of the twelfth epidemiological survey to be carried out on P1 children in Scotland since regular surveys of this age group began in 1988. It thus enables a trend comparison of dental health to be made over more than twenty years. The results show that, in overall dental health terms, the target set for the year 2010 has been met and that there has been a sustained improvement in the level of dental health in P1 children in Scotland, which has now reached its highest level since surveys began in 1988. The proportion of P1 children in Scotland with no obvious decay experience rose from 57.7% in 2008 to 64.0% in 2010.

However, there are still many children with obvious decay experience and dental disease inequalities persist, with children from deprived socioeconomic backgrounds having higher levels of decay. Further efforts should continue to be made to improve dental health in socially deprived areas.

The aim of local and national NHS oral health initiatives undertaken by both the Scottish Government and NHS Boards in recent years has been to increase the prevalence of good oral health from an early age by encouraging daily regular brushing with fluoride toothpaste, by applying fluoride varnish to the teeth and by improving children's diet, especially through reducing the frequency of intake of drinks and foods which contain sugars. Both population-based initiatives and programmes targeted specifically at children who are at increased risk of developing dental disease are being implemented. In this regard, the improving trends in both the increasing proportion of P1 children with no obvious decay experience and the decreasing average number of teeth affected by dental disease are very encouraging. It is anticipated that with the continuation of these initiatives, and with support from parents/carers, healthcare professionals and others, the dental health of children in Scotland will improve still further.

References

1 Pitts NB, Davies JA. Scottish Health Boards' Dental Epidemiological Programme, 1987/88 Report. University of Dundee, 1994.

2 Merrett MCW, Goold S, Jones CM, McCall DR, Macpherson LMD, Nugent Z and Topping GVA. National Dental Inspection Programme of Scotland, Report of the 2008 Survey of P1 Children, Scottish Dental Epidemiological Co-ordinating Committee, 2008.

3 Towards Better Oral Health in Children: A consultation document on children's oral health in Scotland. Scottish Office, 2002.

4 Mitropoulos C, Pitts NB & Deery C. BASCD Trainers' Pack for Caries Prevalence Studies, 1992/93. University of Dundee, 1992.

5 Landis JR & Koch GG. The measurement of observer agreement for categorical data. *Biometrics*, 1977; 33: 159-174.

6 Watkins TR & Pitts NB. Scottish Health Boards' Dental Epidemiological Programme. Protocol; 1994 version. Stirling, 1994.

7 Towards a Healthier Scotland: A White Paper on Health. Scottish Office, 1999.

8 Scottish Index of Multiple Deprivation 2009: Scottish Government, 2010.

9 Carstairs V, Morris R. Deprivation and Health in Scotland. Aberdeen University Press, 1991.

PART 2

Basic Inspection Results

The *Basic Inspection* of the NDIP programme aims to inform the parents/carers of individual P1 and P7 children by letter of the oral health of their child. These letters record the principal clinical findings of the dental inspection of the child and convey the degree of urgency with which an appointment for attendance at a dentist is suggested.

One of three possible letters is sent but all inform the parents/carers about the state of dental health seen in their child at the time of the school inspection. These letters vary slightly depending on whether a P1 or a P7 child has been inspected. The three letters are as follows:

- Letter A - should seek immediate dental care on account of severe decay or abscess.
- Letter B - should seek dental care in the near future due to one or more of the following: presence or history of decay, a broken or damaged front tooth, tooth wear, poor oral hygiene or may require orthodontics (P7 only).
- Letter C - no obvious decay experience but they should continue to see the family dentist on a regular basis.

The results of the *Basic Inspection* are then anonymised and aggregated. They are used to monitor the impact of both local and national oral health improvement programmes, and to assist in the development of local dental services. In the school year 2009/2010, the aim of the *Basic Inspection* of NDIP was to invite children in all P1 and P7 classes of Scottish Local Authority (LA) schools to participate.

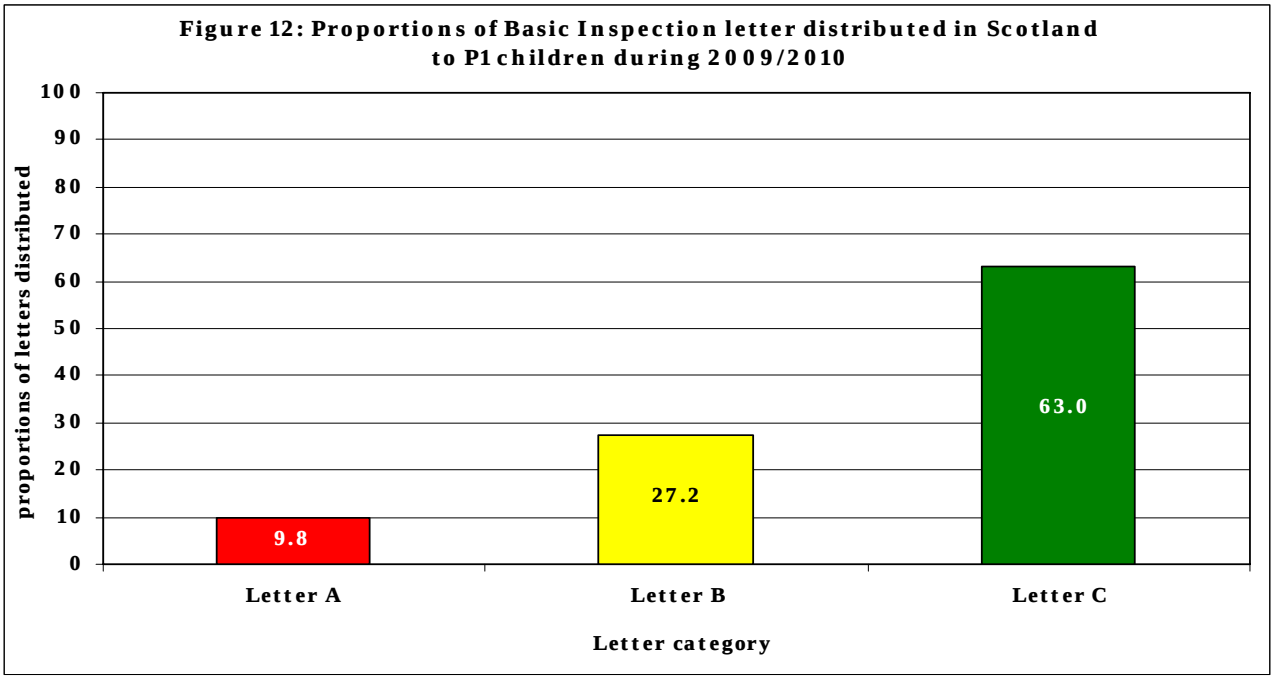
Primary 1 Data

During 2009/2010, all P1 classes of Scottish Local Authority schools were invited to participate. The *Basic Inspections* were conducted in primary schools in all NHS Boards, and overall 48,606 P1 children were inspected (Table 5). This represents 89% of P1 children who attended mainstream Local Authority schools across Scotland in the 2009/2010 school year and whose parents/carers were advised by letter of the oral health of their child.

Table 5 : P1 children inspected by NHS Boards during the school year 2009/2010

NHS Board	Total no. of P1 children in Local Authority schools in 2009/2010	Total no. of P1 children inspected in 2009/2010	Proportion (%) of P1 children inspected in 2009/2010	Proportion (%) of A Letters issued	Proportion (%) of B Letters issued	Proportion (%) of C Letters issued
Ayrshire & Arran	3,840	3,452	89.9	7.5	30.7	61.8
Borders	1,215	1,087	89.5	4.7	20.8	74.5
Dumfries & Galloway	1,420	1,385	97.5	8.0	30.0	62.0
Fife	3,909	3,436	87.9	6.9	28.1	64.9
Forth Valley	3,216	2,938	91.4	7.3	23.9	68.8
Grampian	5,531	4,624	83.6	7.8	23.1	69.2
Greater Glasgow & Clyde	12,689	11,149	87.9	13.6	30.0	56.5
Highland	3,178	2,913	91.7	6.6	30.0	63.4
Lanarkshire	6,470	5,972	92.3	12.7	28.0	59.3
Lothian	8,537	7,355	86.2	8.7	23.7	67.6
Orkney	206	206	100.0	2.4	30.6	67.0
Shetland	260	260	100.0	8.5	23.1	68.5
Tayside	4,102	3,570	87.0	9.9	27.0	63.1
Western Isles	281	259	92.2	11.6	33.6	54.8
SCOTLAND	54,854	48,606	88.6	9.8	27.2	63.0

The relative frequency distribution of the respective letters which were issued to parents/carers of P1 children across Scotland in 2009/2010 is detailed below in Figure 12. Within NHS Board areas, similar comparisons can be made at CHP and Local Authority level, and for each primary school or clusters of schools.



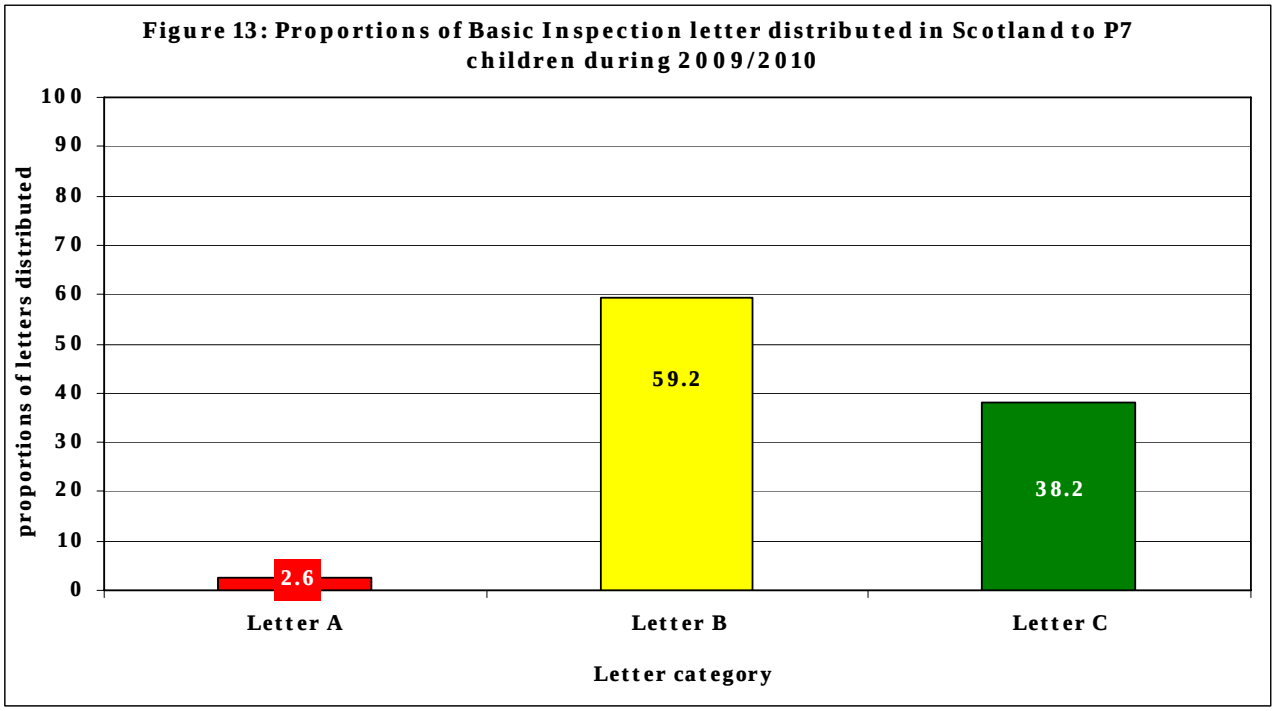
Primary 7 Data

In total, 48,245 P7 children received a *Basic Inspection.* This represents 83% of P7 children attending mainstream Local Authority schools across Scotland (Table 6). As with the P1 children, the parents/carers of those P7 children who received a *Basic Inspection* were issued with a letter explaining the oral health of their child.

Table 6 : P7 children inspected by NHS Boards during the school year 2009/2010

NHS Board	Total no. of P7 children in Local Authority schools in 2009/2010	Total no. of P7 children inspected in 2009/2010	Proportion (%) of P7 children inspected in 2009/2010	Proportion (%) of A Letters issued	Proportion (%) of B Letters issued	Proportion (%) of C Letters issued
Ayrshire & Arran	4,156	3,684	88.6	2.3	59.9	37.8
Borders	1,248	1,021	81.8	0.9	52.7	46.4
Dumfries & Galloway	1,725	1,406	81.5	2.2	58.9	38.9
Fife	4,028	3,304	82.0	3.6	52.9	43.5
Forth Valley	3,521	2,936	83.4	1.0	69.8	29.1
Grampian	6,020	4,640	77.1	3.8	65.3	30.9
Greater Glasgow & Clyde	12,945	11,199	86.5	2.0	51.5	46.5
Highland	3,605	3,227	89.5	2.5	53.7	43.8
Lanarkshire	6,745	5,922	87.8	2.0	56.7	41.2
Lothian	8,730	6,602	75.6	3.1	60.4	36.5
Orkney	213	199	93.4	1.9	62.9	35.2
Shetland	284	242	85.2	4.2	80.6	15.2
Tayside	4,425	3,554	80.3	1.9	55.1	43.0
Western Isles	309	309	100.0	2.9	48.3	48.8
SCOTLAND	57,954	48,245	83.2	2.6	59.2	38.2

The relative frequency distribution of the respective letters which were issued to parents/carers of P7 children across Scotland in 2009/2010 is shown in Figure 13. Within NHS Board areas, similar comparisons can be made at CHP and Local Authority level, and for each primary school or clusters of schools.



Were there any difficulties experienced in collecting the Basic Inspection data?

A range of logistical issues impacted upon the ability of several NHS Boards to deliver comprehensive inspection coverage of all schools. These included limitations in professional workforce in some salaried Community Dental Services in meeting conflicting service demands. However, NHS Boards, CHPs and Local Authorities across Scotland continue to work in partnership to improve the NDIP programme. The coverage of P1 and P7 classes continues to improve, helped as it is by the introduction of better NDIP software specifically designed to collect and analyse the dental inspection data. For the interpretation of any local results contained in Tables 5 and 6, readers are advised to contact the NHS Board concerned.

While the target is that all P1 and P7 children should receive a *Basic Inspection*, it is improbable that this will be conducted on every child within a target population in participating schools for the following reasons: parental permission not given, child unable/unwilling to co-operate or child not at school on the day of the dental inspection. The variation in the size of the P1 population between the *Basic* and *Detailed Inspections* in some areas is a reflection of the different dates of the respective inspections and the fluctuation in numbers of children enrolled in schools at any stage in the school year.

Readers are advised that if more precise details of dental health are required at either national or sub-national level they should refer to the Detailed Inspection results recorded in Part 1 of this Report.

How can the NDIP Programme results be applied to local NHS services, CHPs and Local Authorities?

As noted above, the information from the NDIP programme can be utilised at both NHS Board and at Community Health Partnership (CHP) level. These data can be useful in highlighting areas that require health promotion or dental services input and are a useful monitoring tool over time. Local Authorities can also receive the anonymised and aggregated data at both individual primary school or 'cluster' levels.

With Scottish Government dental initiatives and other appropriate local oral health strategies of NHS Boards either in place or being commenced, an improvement in the level of dental health is expected in both nursery and primary schools, with sustained progress being seen at each of the monitoring levels.

Appendix to *Detailed Inspection*

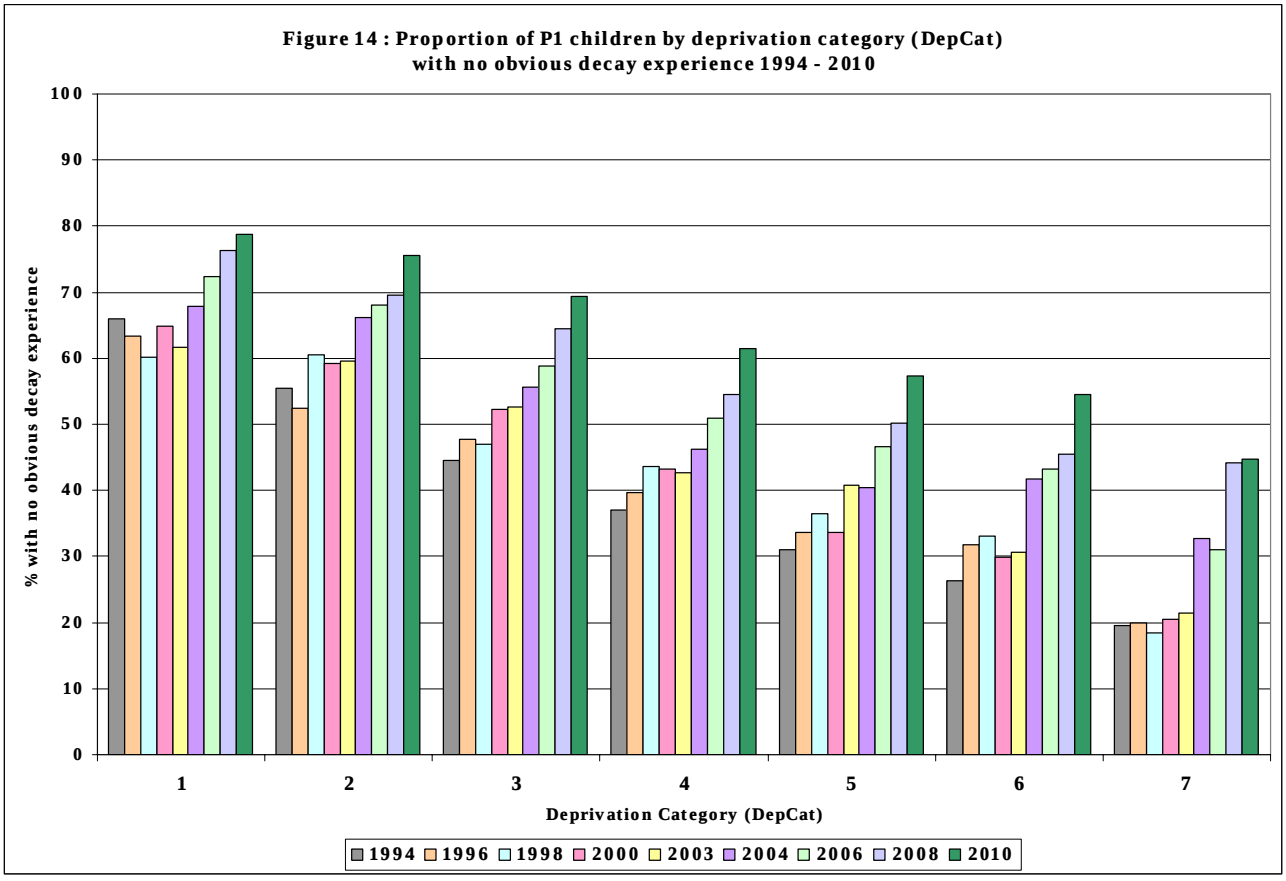
Deprivation Category (DepCat) Data

As noted earlier in the *Detailed Inspection* part of this report, the main NDIP Report now uses the Scottish Index of Multiple Deprivation. However, to enable time trends to be investigated from the perspective of deprivation and dental health inequalities, Figure 14, which displays DepCat data, is included to allow comparison of data from 1994 to 2010.

The deprivation category (DepCat) scale is based on information gathered in the national census every ten years and describes the socio-economic status of communities calculated from the percentage of unemployed males, overcrowded households, lack of car ownership and the Registrar General social class in each postcode sector in Scotland. Current DepCat deprivation categories are based on the population census data of 2001.

The scale ranges from DepCat 1 (least deprived) to DepCat 7 (most deprived). The index has been shown to be closely linked with measures of death, illness and use of health services, and a clear association has been established between DepCat and dental decay in children.

The DepCat gradient across the categories was first used in relation to child dental health in Scotland in the mid-1990s, and the 2010 NDIP Report continues to show a gradient between DepCat 1 and DepCat 7 in relation to the proportion of P1 children with no obvious decay experience.



Between 2008 and 2010, only a small improvement was seen in the DepCat 7 results. This contrasts with the large 13 percentage point increase seen between 2006 and 2008. Overall, however, the Figure illustrates that over the whole period 1994 to 2010 a substantial improvement in dental health has occurred across all DepCat groups.

It is encouraging to note that, with the dental initiatives currently in place and with those in development across Scotland, the dental health of young children should improve still further in the years to come.

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