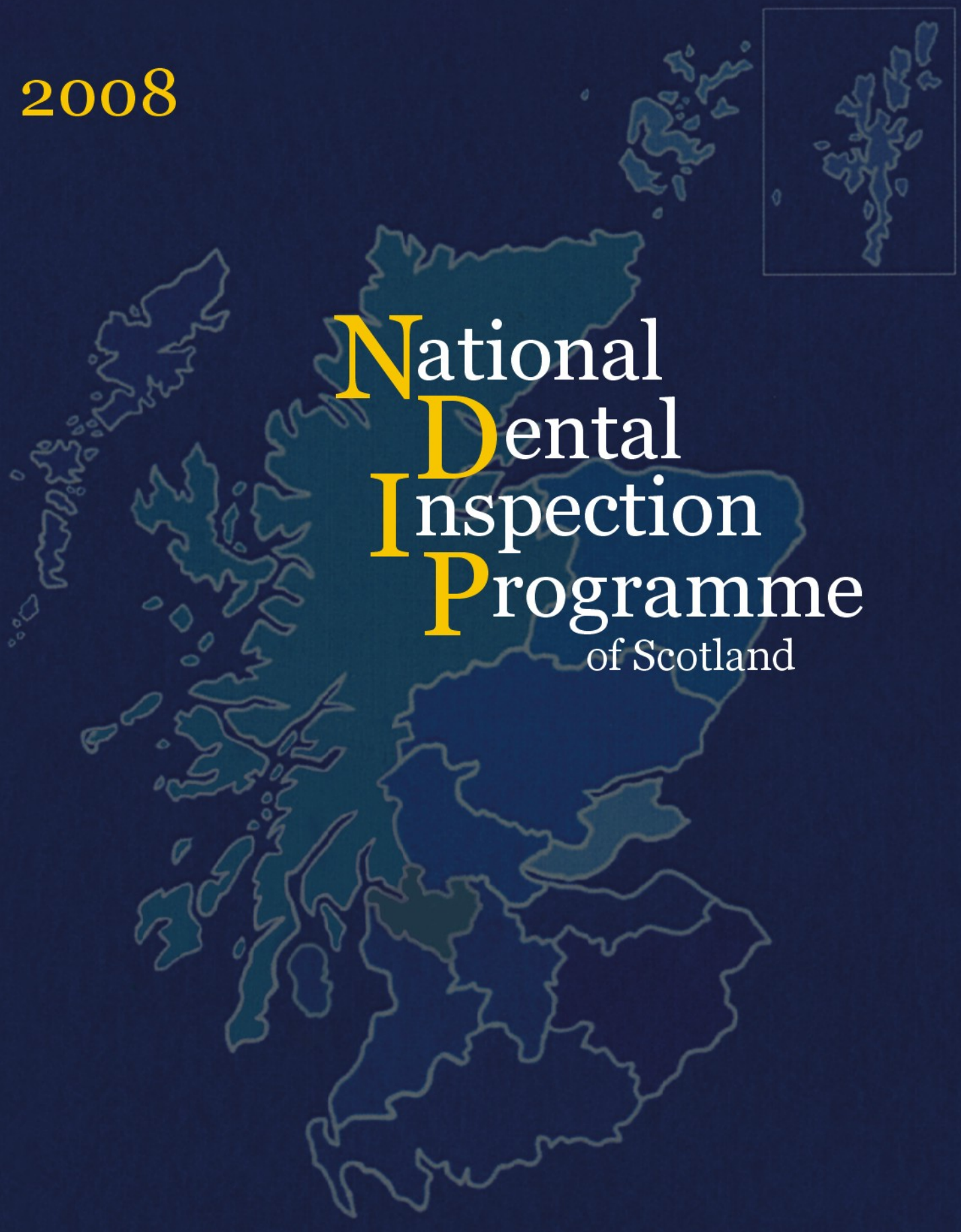
2008



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 2007/2008 prepared for the Scottish Dental Epidemiological Co-ordinating Committee

National Dental Inspection Programme of Scotland

Report of the 2008 Survey of P1 Children

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Published by
Scottish Dental Epidemiological Co-ordinating Committee

ISBN 978-0-9550957-4-0

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The 2008 National Dental Inspection Programme (NDIP)
undertaken in the school year 2007/2008

It is important that every child's dental wellbeing is assessed so that children and their parents 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 will be able to identify trends and assist in planning future 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 2007/2008, the main focus of the *Detailed Inspection* programme was P1.

Dental health of P1 children in Scotland in 2008

At the beginning of their primary school career, nearly 58% of P1 children in Scotland were found to have no obvious dental decay experience in their deciduous teeth (compared to 54% in the P1 survey of 2006[2]). Overall, the results for the 2007/2008 cohort are close to meeting the national target of 60% with no obvious decay experience set for this age group by the Scottish Government, with seven NHS Boards reaching or exceeding this mark. This is an improvement on the 2006 survey of just over three percentage points.

In 2008, the mean $d_3$mft in Scotland has decreased to 1.86 (2.16 in 2006), with the percentage of P1 children across Scotland having obvious decay experience reducing to 42.3%, compared to 45.9% in 2006.

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 where 5-year olds are nearly twice as likely to suffer from obvious decay experience in their deciduous teeth as are children from more affluent homes. However, comparing 2006 with 2008, the proportion with no obvious caries in the most deprived children has changed from 31% to 44% - an improvement of 13 percentage points.

In 2002, the Scottish Executive consultation document 'Towards Better Oral Health in Children'[3] summed up the situation by saying, "*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 2008

The principal aims are to gather appropriate information in order to inform children (and parents) of their dental/oral health status 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 2008 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 Clinical Dental Directors, Community Dental Officers, Scottish NHS Boards, Local Education Authorities and schools, and the Chief Scientist Office's Dental Health Services Research Unit (DHSRU) at the University of Dundee.

What does the Basic NDIP Inspection consist of?

The *Basic Inspection* involves a simple assessment of the mouth of each child using a light, mirror and ball-ended probe. One of three classifications of dental health is then attributed to each child according to the findings of the dental inspection. Following this dental inspection, a letter is sent to inform each child's parents about the state of dental health observed in the mouth of their child at the time of the school inspection. These letters vary depending on whether a P1 or a P7 child was 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: 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 should continue to see the family dentist on a regular basis.

The results of the *Basic Inspection* are then anonymised and aggregated. The data 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 19.

What constitutes a Detailed NDIP Inspection?

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 goals of the *Detailed Inspection* are to determine, in detail, the current levels of established tooth decay experience and the impact of deprivation on the dental health of primary one children in Scotland in 2008. The definition of 'children' in this report relates to P1 children enrolled in Local Authority schools in Scotland.

The remainder of this section of the Report gives the results for the *Detailed Inspection,* while the results for the *Basic Inspection* can be found in Part 2.

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 community 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 Perth in November 2007 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].

These were followed by clinical training sessions using P1 children from three 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] would participate in the actual *Detailed Inspections*.

How many P1 children had a Detailed Inspection?

Each NHS Board was required to identify the number of schools needed to obtain a representative sample of a given size from their primary one population[6]. The sample sizes provided adequate numbers to allow meaningful comparisons between NHS Boards to be drawn.

The sampling procedure for NDIP differs from the previous SHBDEP surveys in so far as whole classes are now selected: this simplifies the process for schools and ensures that results reflect the P1 population (or P7 population) in Scotland.

Table 1 shows that more than 12,000 children across Scotland were inspected, representing 25% of the P1 population. Across all NHS Boards the percentage being inspected ranged from 9% to 93%.

Although a specific minimum number of children must be inspected for a representative sample of an area to be obtained, NHS Boards may choose to increase this sample size in order to assist with their local area planning needs. Less populated boards need to include large proportions in order to achieve statistically meaningful numbers. The figures from NHS Boards are weighted appropriately to generate the Scotland-wide figure.

In the course of the survey, 10% of the children were re-inspected in order to assess the consistency of the examination decisions of the dentists who were undertaking the inspections and thus ensure accuracy of the results.

Table 1: Primary 1 population in Local Authority schools and the number who received a *Detailed Inspection* by NHS Board across Scotland

NHS Board	Primary 1 population in Local Authority schools	Number of P1 children receiving a *Detailed Inspection*	% of P1 population receiving a *Detailed Inspection*
Ayrshire & Arran	3,576	990	27.7
Borders	1,111	281	25.3
Dumfries & Galloway	1,439	453	31.5
Fife	3,754	1236	32.9
Forth Valley	2,901	658	22.7
Grampian	5,397	758	14.0
Greater Glasgow & Clyde	10,808	4,620	42.7
Highland	3,013	758	25.2
Lanarkshire	6,161	577	9.4
Lothian	7,375	1,014	13.7
Orkney	184	153	83.2
Shetland	240	217	90.4
Tayside	3,728	467	12.5
Western Isles	281	260	92.5
Total for Scotland	**49,968**	**12,442**	**24.9**

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

The NDIP inspections took place from November 2007 until June 2008. 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 5.54 years of age – this was similar to the 2006 figure of 5.49 and the 2004 figure of 5.51[7]. The mean age for girls was 5.56 while the mean age for boys was 5.52.

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).

N.B. The *Detailed Inspection* measures obvious decay into dentine when seen under school (rather than dental surgery) conditions.

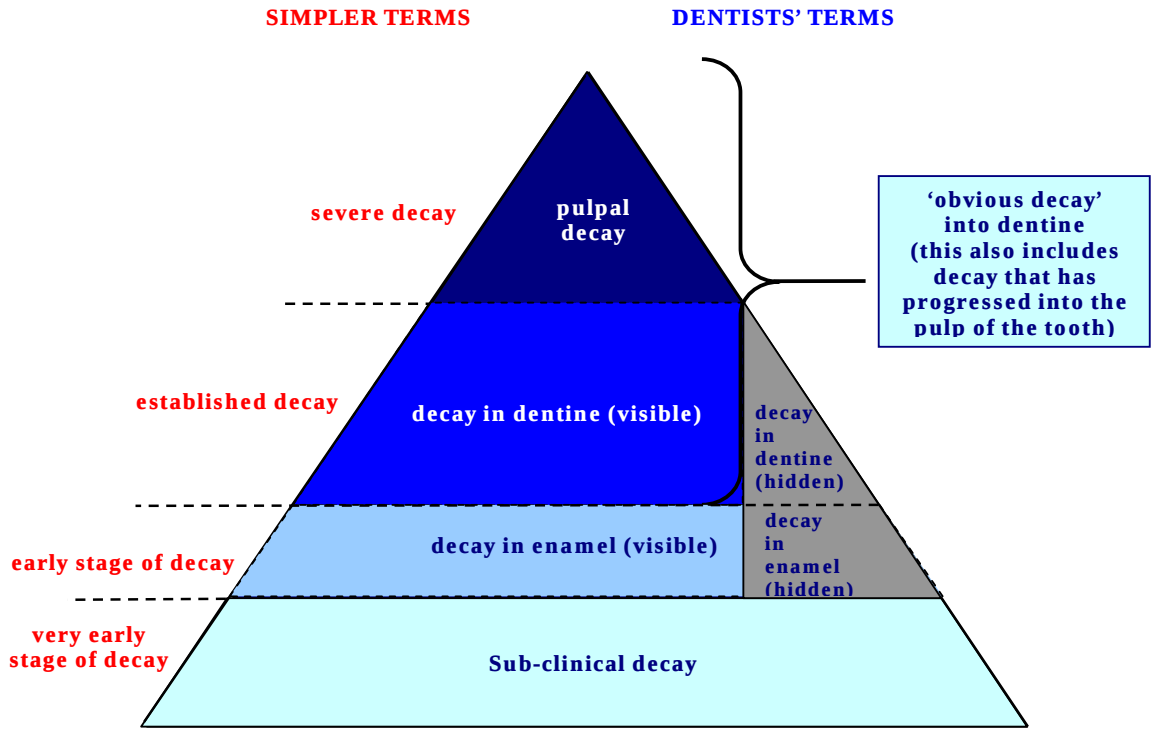
What is meant by 'obvious decay experience' in this report?

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:
Stages of tooth decay



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.

National Dental Inspection Programme (NDIP) 2008

PART 1

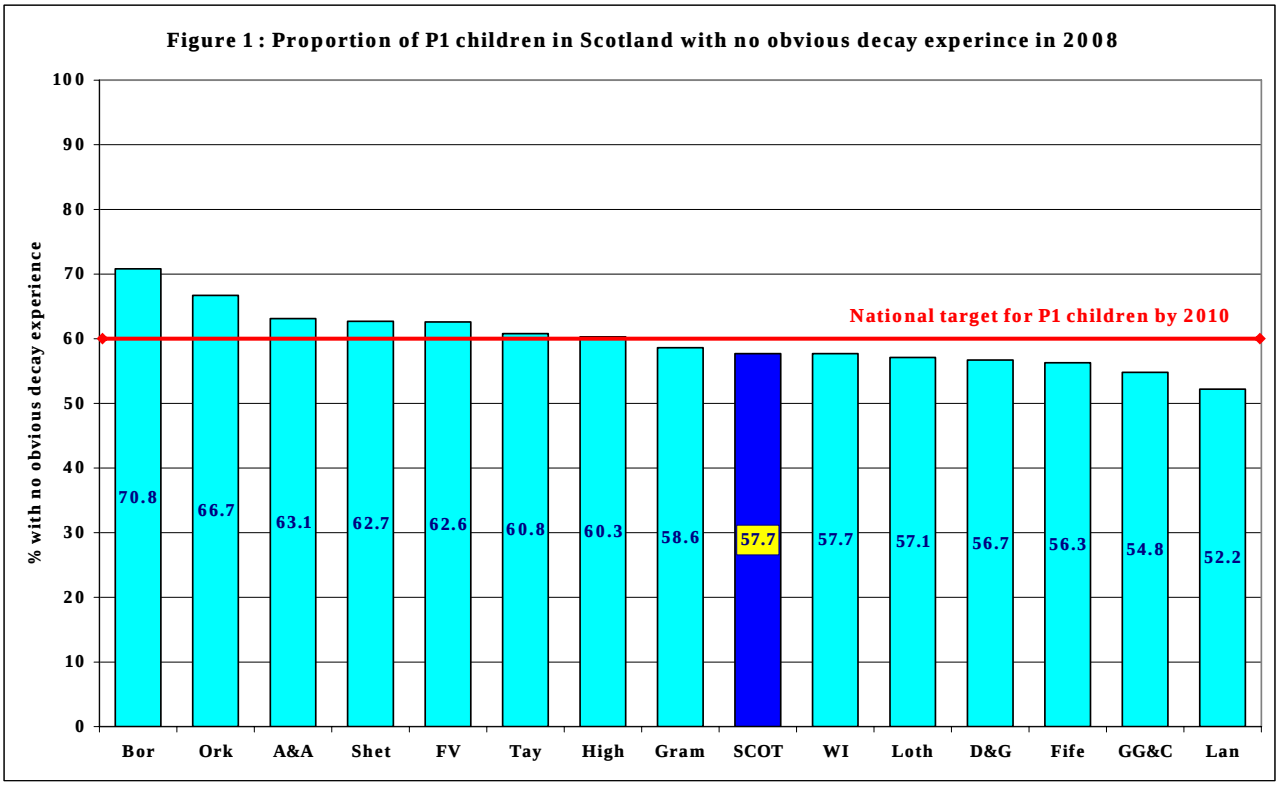
DETAILED INSPECTION RESULTS

What proportion of P1 children in Scotland had no obvious decay experience in 2008?

One of the dental targets set by the then Scottish Executive in 1999[8] 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, 57.7% of P1 children fall into this category, with a range of 52.2% to 70.8% across the fourteen NHS Boards.

These findings illustrate the extent to which some NHS Boards have already achieved the 2010 target and how close other NHS Boards are to achieving that same target.



The level for Scotland of 57.7% with no obvious decay experience is a benchmark figure against which future P1 *Detailed Inspection* results will be measured and is an improvement over the 2006 P1 NDIP Report, where the figure for Scotland was 54.1%.

The level for Scotland of 57.7% 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 2008?

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 1.86, for the 42.3% of these children who had experienced dental decay the average number of affected teeth was more than double this figure at 4.39 – this compares to 4.69 found in the 2006 survey.

The mean $d_3$mft for P1 males was 1.90 (comprising d_3t 1.23, mt 0.51 and ft 0.17) while that for P1 females was 1.82 (1.19, 0.43 and 0.20 respectively).

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

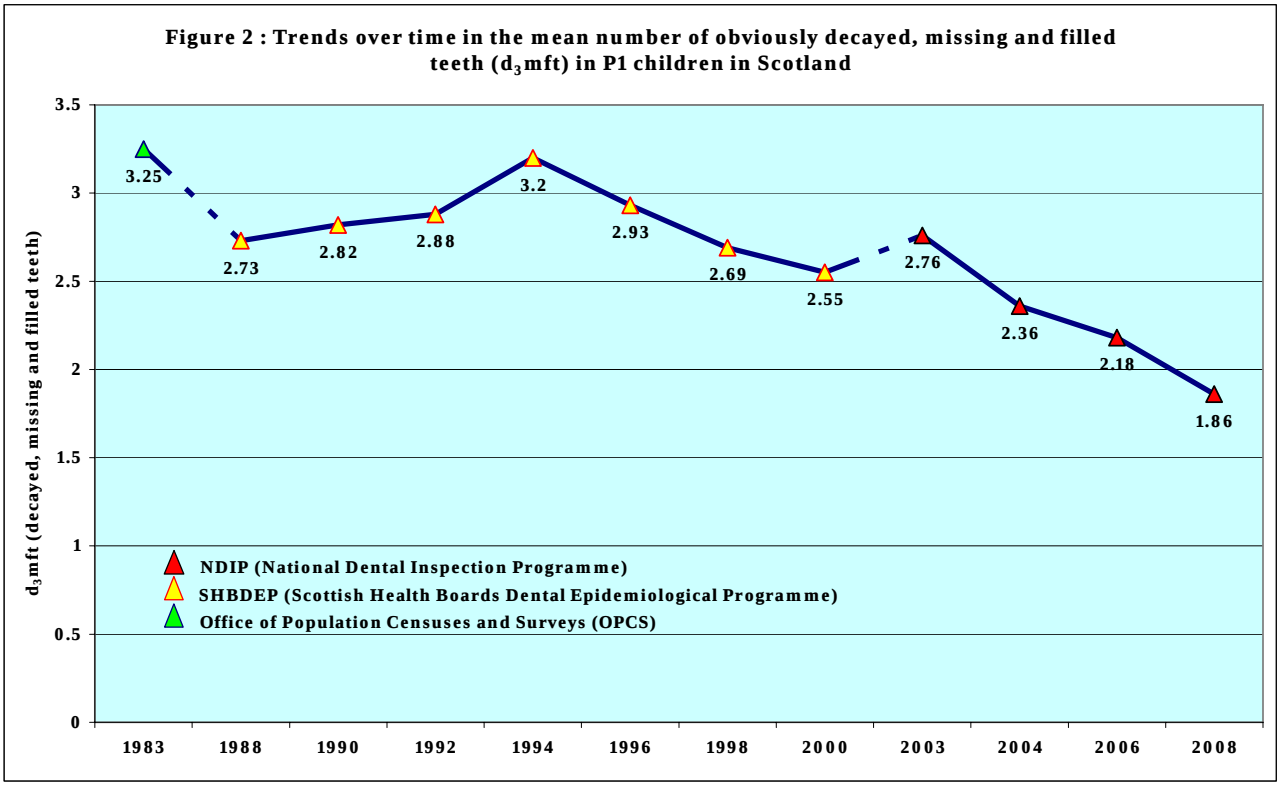
Table 2: Overall obvious decay experience in deciduous teeth of P1 children in Scotland

	%	NHS Boards
Free of obvious decay experience at the dentinal level ($d_3$mft = 0)	57.7	52.2 – 70.8
With obvious decay experience, $d_3$mft>0 (as per BASCD)	42.3	29.2 – 47.8
With 'current decay', d_3>0 (as per BASCD)	34.7	25.3 – 40.7
Care index (ft/$d_3$mft)	9.68	4.7 – 19.6
	Mean	**NHS Boards**
Obvious decay experience ($d_3$mft) across Scotland	1.86	1.24 – 2.14
Decayed teeth (d_3t) across Scotland	1.21	0.90 – 1.42
Missing teeth (mt) across Scotland	0.47	0.07 – 0.63
Filled teeth (ft) across Scotland	0.18	0.08 – 0.32
Decayed, missing and filled teeth for those with obvious decay experience ($d_3$mft>0)	4.39	3.68 – 4.59

How has the dental health of P1 children in Scotland fared 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 rapid decline over the last five years. The value of 1.86 is the lowest level since data began to be collected in 1983[9].

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 2008 NDIP Report on P1 children shows a continuing improvement in the proportion with good dental health.

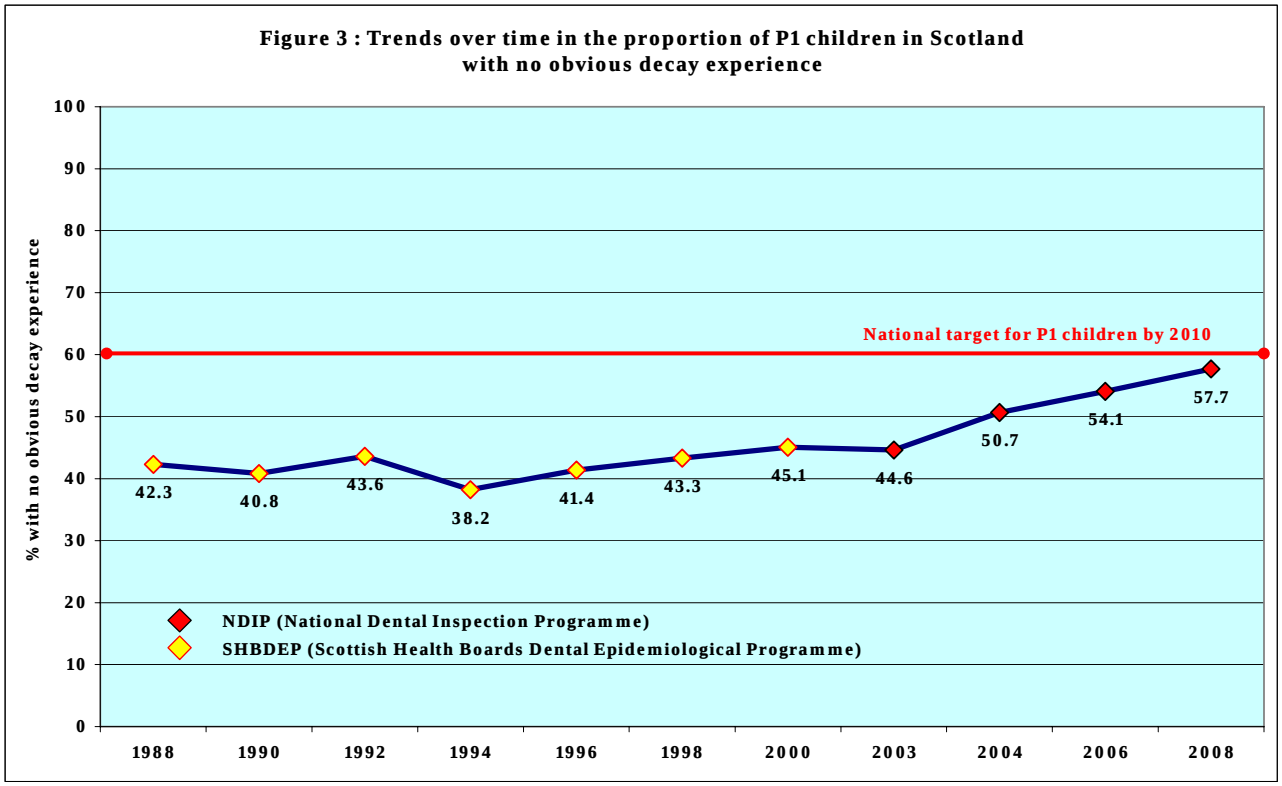
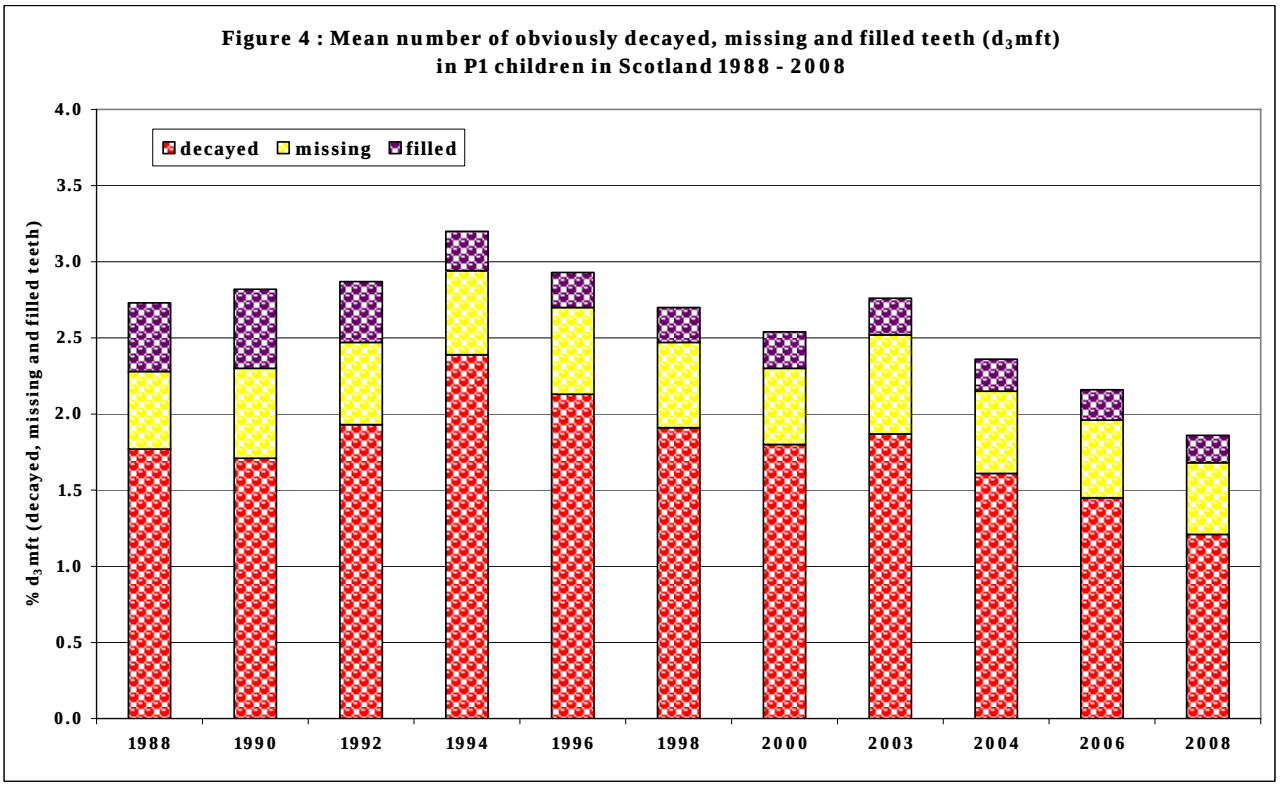


Figure 4 illustrates the changes that have occurred in the number of obviously decayed, missing and filled teeth ($d_3$mft) for P1 children in Scotland over the period 1988 to 2008.



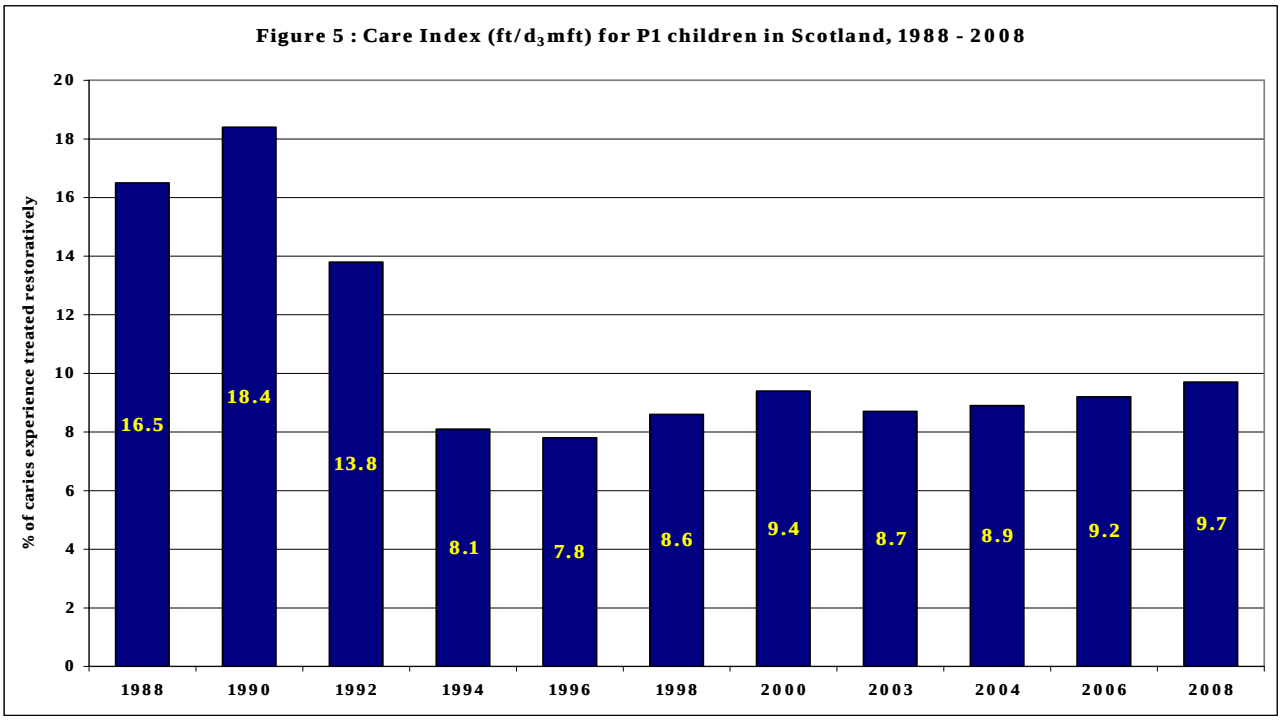
The importance of monitoring the dental health of children and being able to make comparisons over a long period of time is illustrated in Figure 4. By viewing the results as a series, rather than making year-on-year comparisons, the trend in the number of decayed, missing and filled teeth ($d_3$mft) can be seen. Since the 1990s, the underlying trend has been a fall in the mean number of obviously decayed, missing and filled teeth ($d_3$mft) of P1 children in Scotland, with the most rapid falls in the last four years. The largest reduction is in the decayed component.

In the 2008 NDIP *Detailed Inspection* of P1 children across Scotland, the number of obviously decayed, missing and filled teeth ($d_3$mft) had reached a figure of 1.86 - the lowest level since epidemiological dental surveys of this child age group began in 1988.

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 10% 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.

Figure 5 : Care Index (ft/$d_3$mft) for P1 children in Scotland, 1988 - 2008



Although NHS dental registration rates have improved, there are still large numbers of children in P1 who are not registered with an NHS dental practice and the Scottish Government and NHS Boards continue to encourage improvement in this area.

The process of engagement with NHS dental services does not end with simply registering with a dental practice. Patients register with an NHS general dental practitioner to receive the full range of treatment available under NHS general dental services. Before April 2006, all registrations automatically lapsed after 15 months, unless the patient returned within the period to the same or another NHS practice; since April 2006, this registration period has been increased to 36 months. The change in the regulations means that patients stay registered with their NHS dentist – and will be entitled to receive the full range of dental treatment available under the General Dental Services (GDS) – for a longer period (unless de-registered).

To encourage families, projects supported by the NHS in Scotland, including locally co-ordinated community health improvement programmes that promote children's dental registration, are encouraging parents 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, 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 42.3% of P1 children had 100% of the obvious decay experience while an unfortunate 11% had 50% of the recorded decay experience. All of the teeth with observed severe decay into the pulp were seen in just 3% of the children inspected.

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

Share of disease		Proportion of P1 population
Established decay experience ($d_3$mft)		
100% of teeth with established decay experience	was observed in	42% of population
50% of teeth with established decay experience	was observed in	11% of population
25% of teeth with established decay experience	was observed in	4% of population
Established decay (d_3t)		
100% of teeth with established decay	was observed in	19% of population
50% of teeth with established decay	was observed in	5% of population
25% of teeth with established decay	was observed in	2% of population
Severe decay into the pulp		
100% of teeth with severe decay	was observed in	3% of population
50% of teeth with severe decay	was observed in	1% of population
25% of teeth with severe decay	was observed in	0.3% of population

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 [$d_3$mft]).

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 ($d_3$mft)	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 ($d_3$mft>0)
Ayrshire & Arran	63.1	1.60	0.93	0.50	0.17	4.33
Borders	70.8	1.31	0.90	0.18	0.22	4.48
Dumfries & Galloway	56.7	1.81	1.30	0.23	0.28	4.18
Fife	56.3	1.91	1.10	0.63	0.19	4.38
Forth Valley	62.6	1.71	1.15	0.49	0.08	4.59
Grampian	58.6	1.70	1.16	0.36	0.19	4.10
Greater Glasgow & Clyde	54.8	2.07	1.40	0.49	0.18	4.58
Highland	60.3	1.58	1.09	0.29	0.21	3.99
Lanarkshire	52.2	2.14	1.42	0.54	0.17	4.46
Lothian	57.1	1.90	1.15	0.55	0.20	4.43
Orkney	66.7	1.24	0.96	0.14	0.14	3.73
Shetland	62.7	1.37	0.99	0.23	0.16	3.68
Tayside	60.8	1.74	1.12	0.44	0.18	4.45
Western Isles	57.7	1.63	1.24	0.07	0.32	3.85
All Scotland	57.7	1.86	1.21	0.47	0.18	4.39

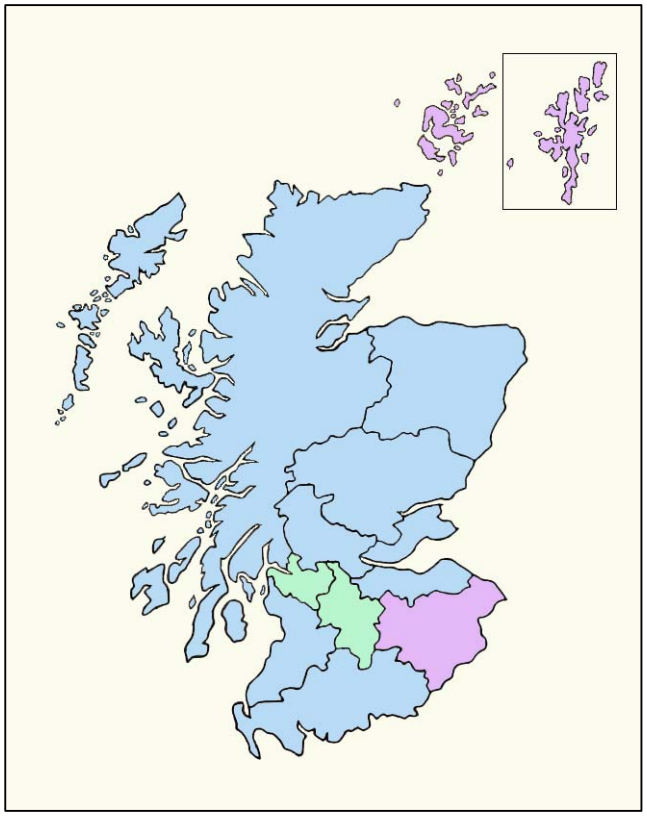


Figure 6:

**Obvious decay experience ($d_3$mft)
in deciduous teeth
of P1 children in Scotland
by NHS Board**

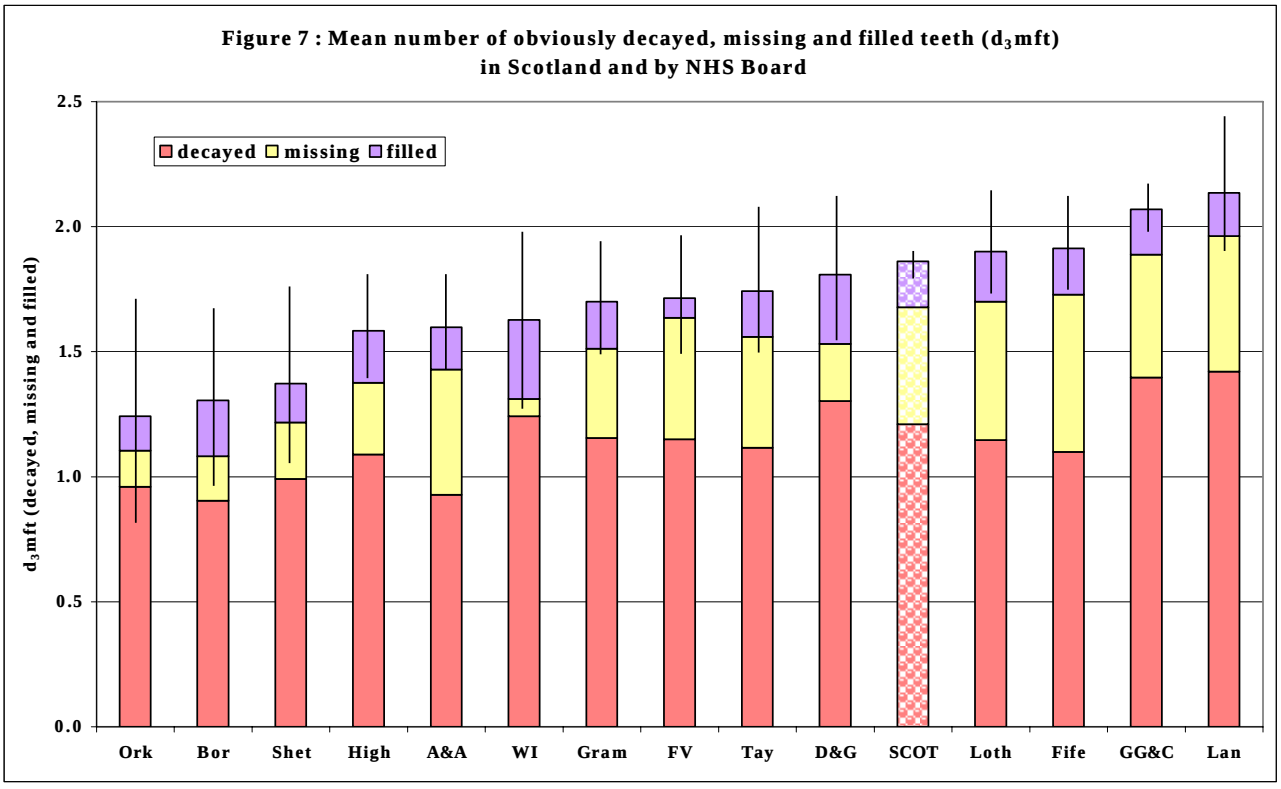
Mean number of decayed, missing and filled teeth ($d_3$mft)

<1.50
1.50 – 2.00
>2.00

Figure 6 illustrates the mean level of obvious decay experience in deciduous teeth across Scotland. The contrast between Orkney, Shetland and Borders compared to Greater Glasgow & Clyde and Lanarkshire, shows the variation in dental health that exists in this age group across the country.

The amount of obvious decay experience 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 ($d_3$mft) in Scotland and by NHS Board



The results in Figure 7 show the average number of decayed, missing and filled teeth per 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 child in Lanarkshire has nearly twice the amount of dental disease as their counterpart in Orkney.

However, the observed dental health in both Lanarkshire and Greater Glasgow & Clyde has improved when compared to the 2006 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 extreme 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.

The position of the mean number of decayed, missing and filled teeth (d_3mft) for Scotland illustrates how greatly this figure is influenced by their P1 child population base in a few of the larger NHS Boards. These NHS Boards have a larger proportion of the P1 child population living in more deprived areas than elsewhere in Scotland, therefore, any significant change in the dental health of these young children will have a great influence on the mean for Scotland as a whole.

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.

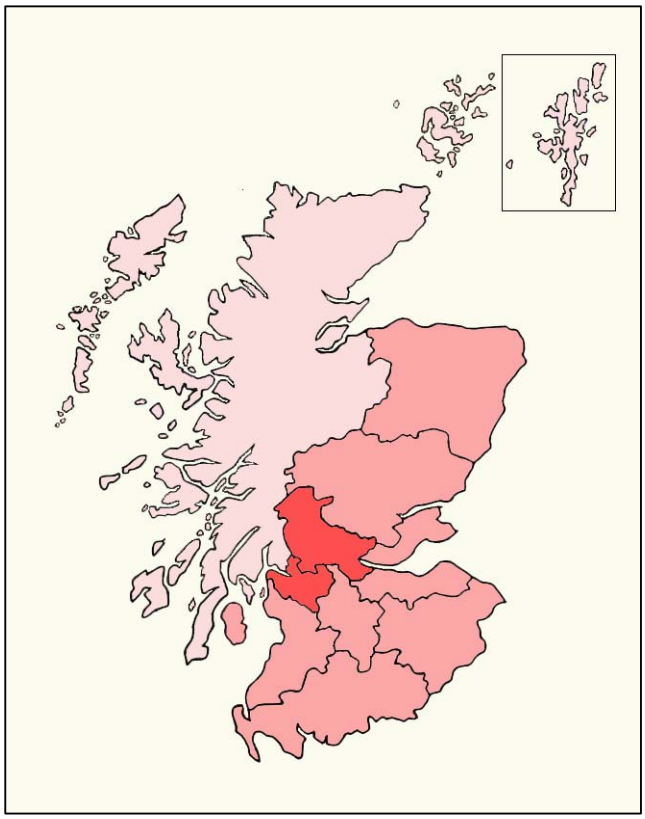


Figure 8:

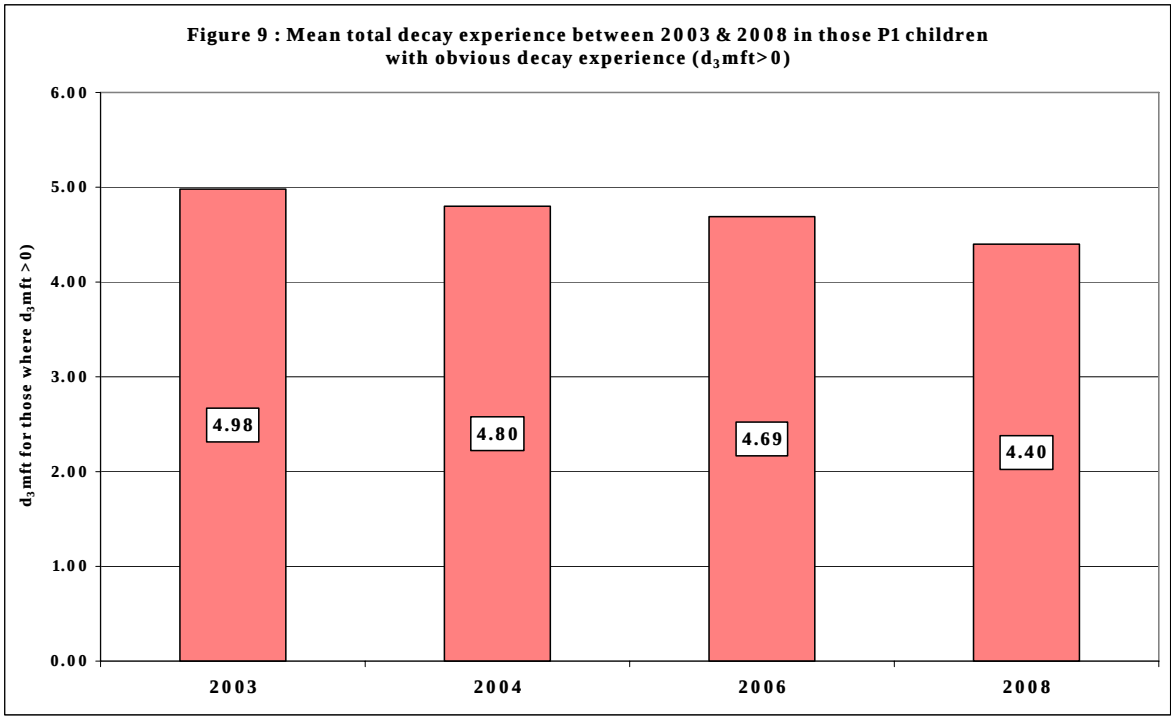
Level of decay experience in the deciduous teeth of P1 children for those with obvious decay experience (d_3mft for those where $d_3mft>0$)

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

< 4.00
4.00 – 4.50
> 4.50

In this 2008 survey, 42.3% of P1 children in Scotland had obvious decay experience in their deciduous teeth. For those children, the mean number of affected teeth was 4.39, ranging from 3.68 to 4.59 across the fourteen NHS Boards (as detailed in Table 4). Since the last survey of this age group in 2006, this is 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.

When the mean total decay experience of those P1 children in Scotland with obvious decay experience ($d_3mft>0$) is examined, a continuing decrease in the amount of decay present in the mouth is observed. This decrease can be seen in Figure 9, with the largest fall occurring between 2006 and 2008.



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

As noted in the 2007 NDIP Report on P7 children, all future NDIP surveys on deprivation will report using mainly the newer Scottish Index of Multiple Deprivation (SIMD)[10], rather than the deprivation category (DepCat)[11] used previously. The SIMD classification identifies small area concentrations of multiple deprivation across all of Scotland 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 category 1 is the least deprived and category 5 is the most deprived. Figure 10 illustrates the relationship between dental health and these quintiles.

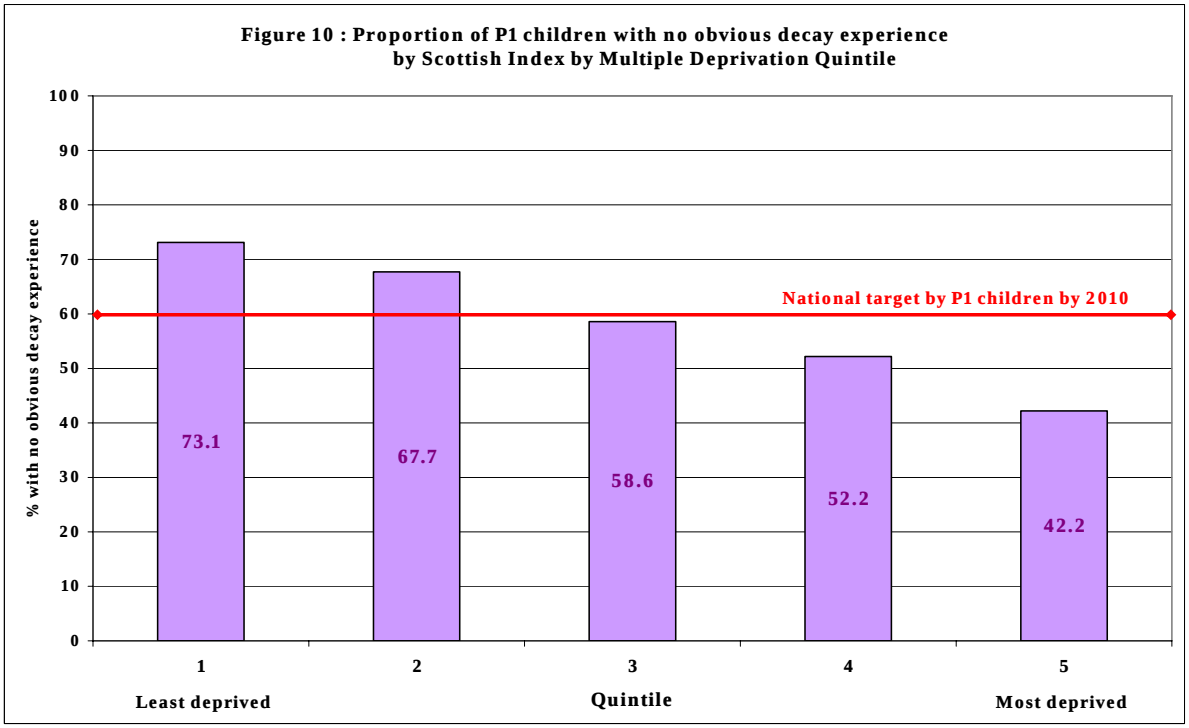


Figure 10 graphically illustrates the difference in dental health between P1 children in the different deprivation categories. SIMD quintiles 1 and 2 have already reached the 2010 National Target of 60% with no obvious decay experience, while quintiles 4 and 5 - the most deprived areas - fall well short, with only 42% of P1 children in quintile 5 having no obvious decay experience.

It was possible to attribute SIMD values to data for 96% of the 12,442 children who were examined in this *Detailed Inspection*. Complete postcode unit information was absent from one NHS Board, incomplete for twelve NHS Boards and 100% complete in only two NHS Boards.

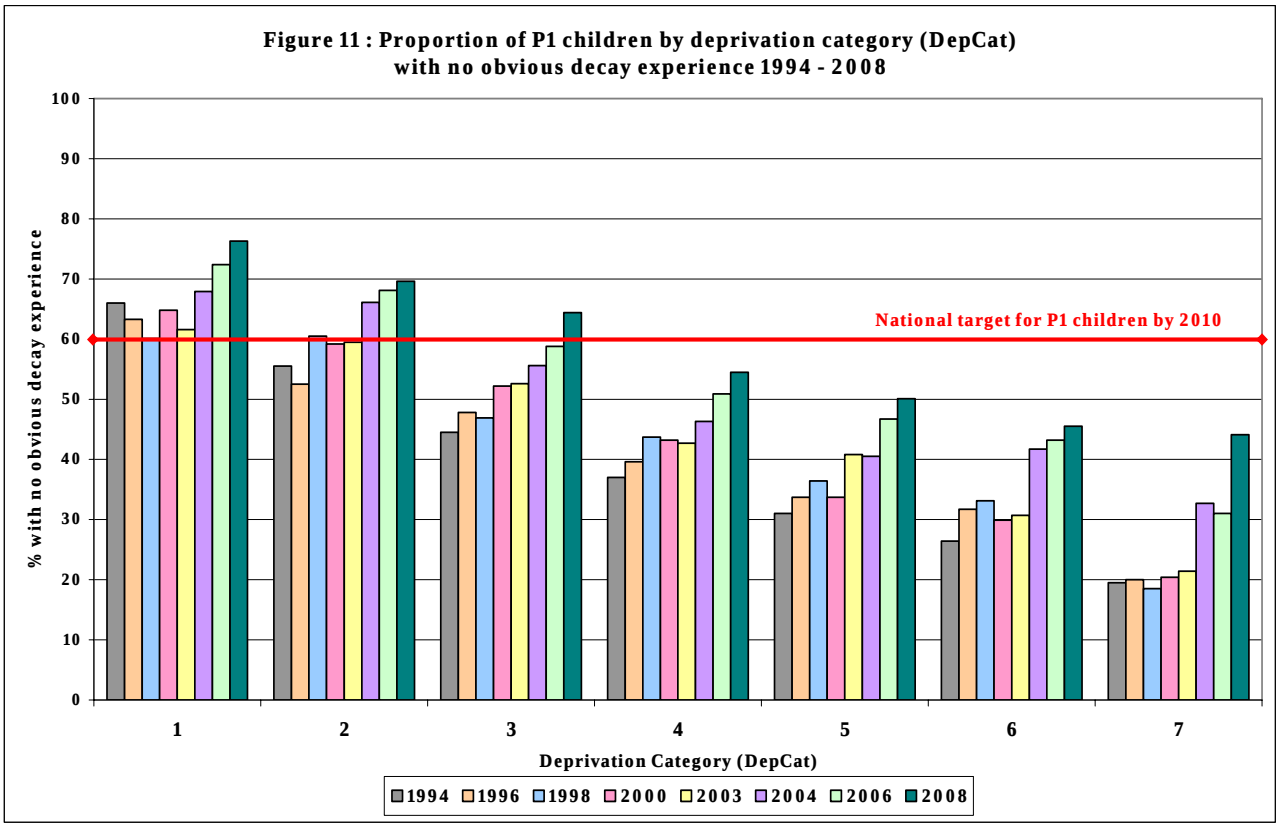
A similar histogram but based on deciles can be seen in the appendix to the *Detailed Inspection* section at the end of this report. The decile classification has 10 divisions of deprivation from 1 (least deprived) to 10 (most deprived).

As SIMD data are being used for the first time in this report, it is not yet possible to demonstrate change when this new measure of deprivation is applied. The DepCat data reported in the previous seven epidemiological dental surveys of five-year-old children across Scotland, together with those obtained in 2007/2008, are detailed in Figure 11 below.

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 DepCat gradient across the categories was first used in relation to child dental health in Scotland in the mid-1990s, and the 2008 NDIP Report continues to show a gradient between DepCat 1 and DepCat 7 in relation to the proportion of five-year old children with no obvious decay experience.

Figure 11 : Proportion of P1 children by deprivation category (DepCat) with no obvious decay experience 1994 - 2008



In Figure 11, when comparing the 2008 P1 NDIP Report with previous P1 Reports, it is encouraging to note that all seven categories of deprivation continue to show an improvement in the proportion of those with no obvious decay experience.

DepCat 7 shows the greatest improvement of thirteen percentage points between 2006 and 2008.

What changes in the dental health of P1 children by deprivation are shown in this 2008 NDIP report?

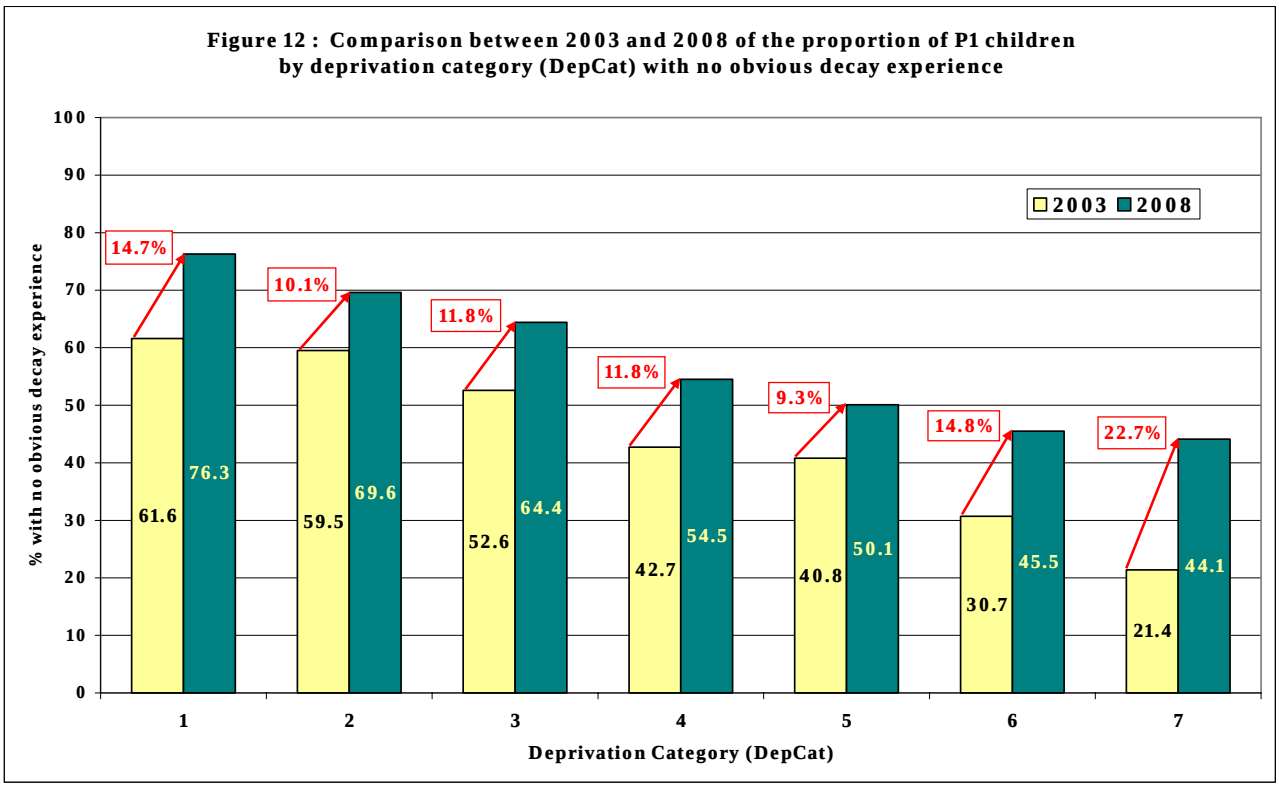
Although Figure 11 illustrates the changes in the level of dental health of P1 children across the seven deprivation categories since data collection began in 1994, a clearer view of the changes over time may be seen in Figure 12 by simplifying the data to only compare the results recorded in 2003, the first year of the NDIP Report on P1 children, and the current P1 report of 2008.

The 2003 data records the proportion of P1 children with no obvious decay experience before the introduction of major dental health initiatives across Scotland while the 2008 data show the level of dental health observed after the introduction of both local NHS Board and more recently, the national dental initiatives of the Scottish Government.

The improvement in the dental health of P1 children in Scotland with no obvious decay experience between 2003 and 2008 can be plainly seen. During this period, all seven deprivation categories have shown a marked improvement which is reflected in the steadily improving trend in dental health seen in P1 children across Scotland in recent years.

The most marked improvements can be seen in the three categories where deprivation is most marked. Deprivation categories 5, 6 and 7 have show improvements of 9.3, 14.8 and 22.7 percentage points respectively between 2003 and 2008. These changes suggest that the introduction of the major dental health initiatives is not only beginning to improve the dental health of P1 children in Scotland, but also may be producing a narrowing of the difference in the level of dental health between those living in the least and the most deprived communities in Scotland.

Figure 12 : Comparison between 2003 and 2008 of the proportion of P1 children by deprivation category (DepCat) with no obvious decay experience



When the results for these P1 children with no obvious decay experience by deprivation category are compared, the gradient between the more deprived categories and those in the least deprived continues to exist. However, it does show that over time, across all seven deprivation categories, the percentage of primary one children with no obvious decay experience is continuing to increase.

What do the findings of this 2008 NDIP Detailed Inspection Report show?

The 2008 Report presents the findings of the eleventh epidemiological survey to be carried out on this age group of 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 twenty years. The Scottish Government requires regular data reporting of this P1 age group and has set a national target of 60% being free of obvious decay experience by the year 2010. The results

show that, in overall dental health terms, 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. However, there are still many children with obvious decay experience.

The prevalence of obvious decay experience in the deciduous teeth of P1 children still varies between NHS Boards, with high levels of decay still associated with children from more socially deprived backgrounds. However, over the last five years, the level of dental health of this age group in Scotland has continued to improve. It is of importance to note that the national dental health target has nearly been achieved, with the proportion of P1 children in Scotland with no obvious decay experience rising from 42.4% in 1988 to 57.7% in 2008. It is of importance to note that the improvement is most marked in those areas where deprivation is greatest.

However, dental disease inequalities still persist, with children from socially deprived backgrounds having higher levels of decay. Further efforts should continue to be made to improve dental health in these 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 high 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 the support from parents, healthcare professionals and others, the dental health of children in Scotland will improve still further.

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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 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 2007/2008, 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

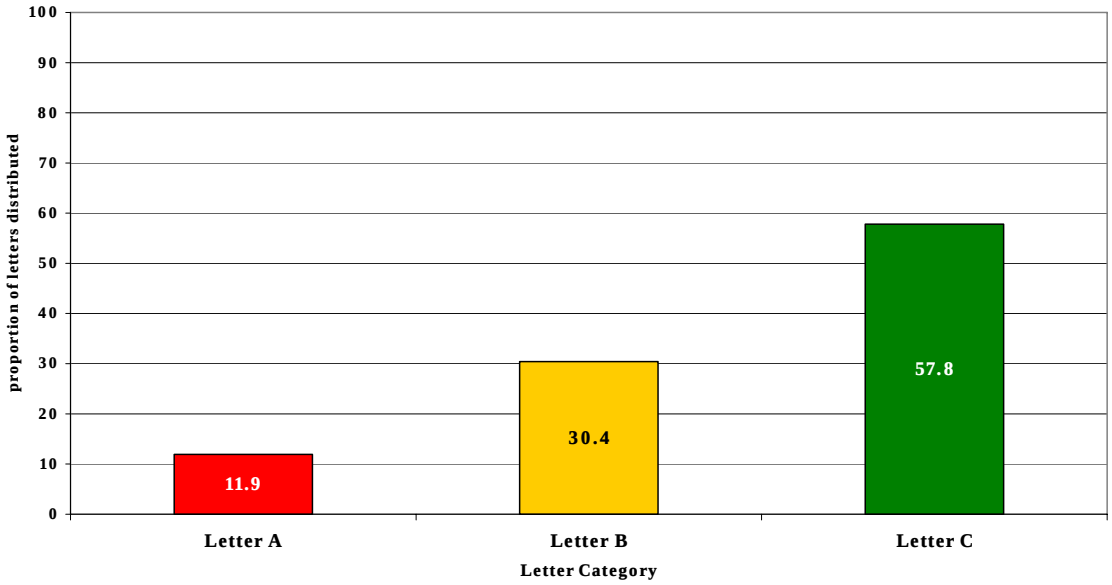
During 2007/2008, all P1 classes of Scottish Local Authority schools were invited to participate. The *Basic Inspections* were conducted in primary schools in all NHS Boards, and overall 43,468 P1 children were inspected (Table 5). This represents 87% of P1 children who attended mainstream Local Authority schools across Scotland in the 2007/2008 school year and whose parents/guardians were advised by letter of the oral health of their child.

Table 5 : **Number of P1 children inspected by NHS Boards during the school year 2007/2008**

NHS Board	Total no. of P1 children in Local Authority schools 2007/2008	Total no. of P1 children inspected 2007/2008	Proportion of P1 children inspected 2007/2008	Total no. of A Letters issued	Total no. of B Letters issued	Total no. of C Letters issued
Ayrshire & Arran	3,576	3,256	91.1	240	1,124	1,892
Borders	1,111	990	89.1	36	251	703
Dumfries & Galloway	1,439	473	32.9	60	145	268
Fife	3,754	3,097	82.5	250	947	1,900
Forth Valley	2,901	1,748	60.3	168	454	1,126
Grampian	5,386	4,769	88.5	494	1,462	2,813
Greater Glasgow & Clyde	10,808	10,156	94.0	1,761	3,147	5,248
Highland	3,013	2,596	86.2	253	803	1,540
Lanarkshire	6,161	5,532	89.8	652	1,772	3,108
Lothian	7,375	6,775	91.9	764	1,854	4,157
Orkney	194	168	86.6	6	49	113
Shetland	240	225	93.8	22	66	137
Tayside	3,728	3,419	91.7	427	1,031	1,961
Western Isles	281	264	94.0	18	96	150
SCOTLAND	**49,967**	**43,468**	**87.0**	**5,151**	**13,201**	**25,116**

The relative frequency of distribution of the respective letters which were issued to parents of P1 children across Scotland in 2007/2008 is detailed below 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.

Figure 13 : Proportion of *Basic Inspection* letters distributed in Scotland to P1 children during 2007/2008



Primary 7 Data

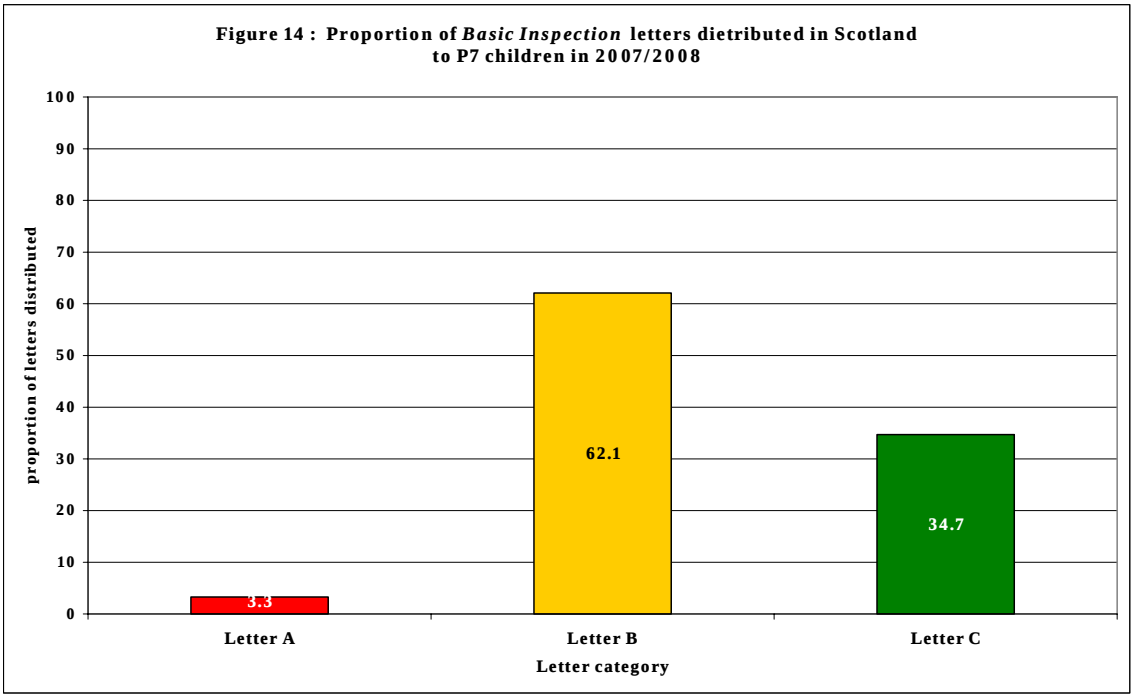
In total, 46,338 P7 children received a *Basic Inspection.* This represents 83% of P7 children attending mainstream Local Authority schools across Scotland (Table 6). As with the P1 children, all the parents of each P7 children who received a *Basic Inspection* were advised by letter of the oral health of their child.

Table 6 : **Number of P7 children inspected by NHS Boards during school year 2007/2008**

NHS Board	Total no. of P7 children in Local Authority schools 2007/2008	Total no. of P7 children inspected 2007/2008	Proportion of P7 children inspected 2007/2008	Total no. of A Letters issued	Total no. of B Letters issued	Total no. of C Letters issued
Ayrshire & Arran	4,243	3,710	87.4	85	2,104	1,521
Borders	1,245	1,097	88.1	12	696	389
Dumfries & Galloway	1,701	382	22.5	5	259	118
Fife	4,122	3,235	78.5	93	1,546	1,596
Forth Valley	3,200	1,849	57.8	40	902	907
Grampian	5,691	4,605	80.9	95	2,784	1,726
Greater Glasgow & Clyde	12,048	10,987	91.2	615	7,740	2,632
Highland	3,469	2,895	83.5	70	2,064	761
Lanarkshire	6,808	6,083	89.4	171	4,004	1,908
Lothian	7,803	7,004	89.8	214	3,971	2,819
Orkney	245	222	91.0	*	117	105
Shetland	273	242	88.6	*	148	94
Tayside	4,611	3,717	80.6	113	2,193	1,411
Western Isles	356	310	87.1	*	245	65
SCOTLAND	**55,815**	**46,338**	**83.0**	**1,513**	**28,773**	**16,052**

N.B. *Any numbers less than 5 have been asterisked (*) out, as these are potentially identifying and compromise confidentiality.*

The relative frequency of distribution of the respective letters which were issued to parents of P7 children across Scotland in 2007/2008 is shown in Figure 14. 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 manpower in some salaried Community Dental Services in meeting conflicting service demands and difficulties with some of the IT software. However, NHS Boards, CHPs and Local Authorities across Scotland continue to work in partnership to improve the NDIP programme. The coverage of both P1 and P7 classes has continued 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.

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 the Scottish Government dental initiatives and other appropriate local oral health strategies of NHS Boards either in place or being initiated, 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.

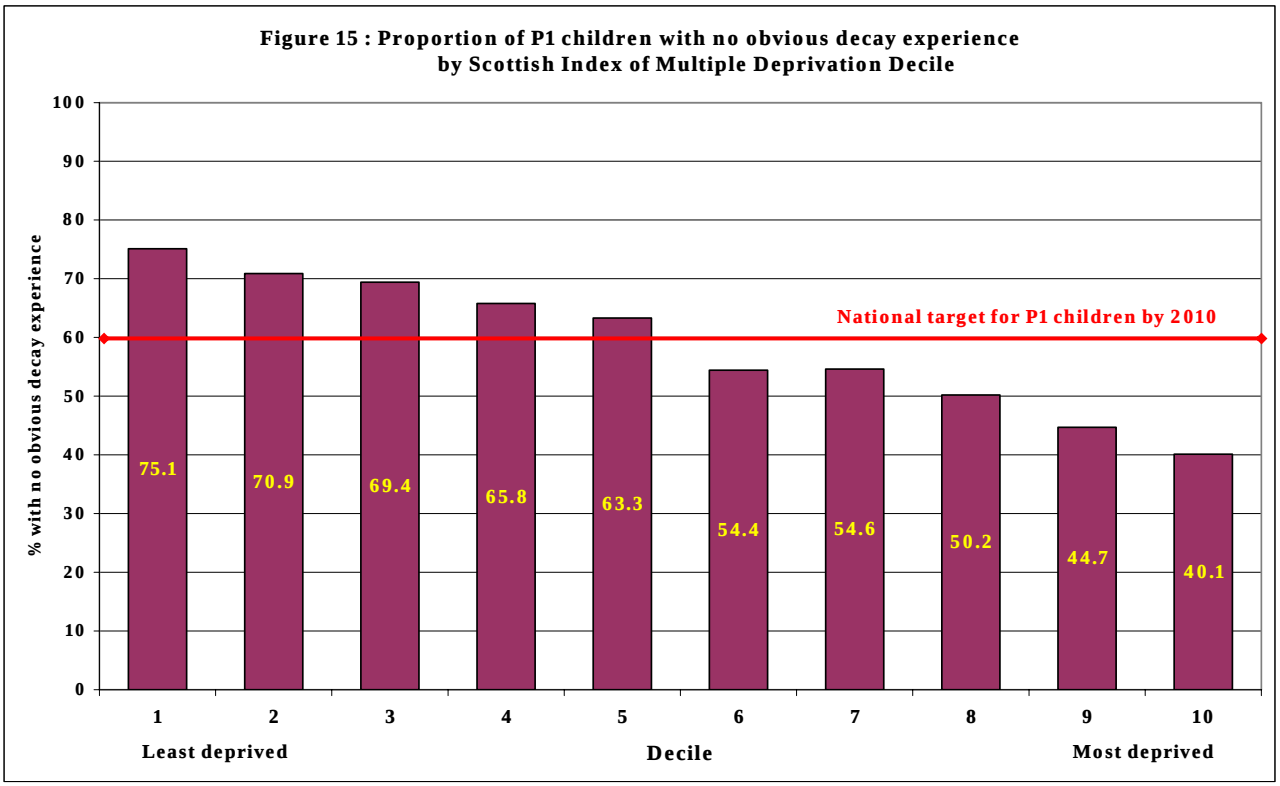
Appendix to *Detailed Inspection*

Scottish Index of Multiple Deprivation Deciles Classification

The SIMD classification identifies small area concentrations of multiple deprivation across all of Scotland and is presented at data zone level using 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 pick out area concentrations of multiple deprivation.

As noted earlier in the *Detailed Inspection* part of this report, the 2008 NDIP P1 Report uses the new Scottish Index of Multiple Deprivation to report deprivation for the first time. The main NDIP report uses quintiles, while data from the other principal classification of deciles, where category 1 is the least deprived and category 10 is the most deprived, appear in Figure 15.

Figure 15 : Proportion of P1 children with no obvious decay experience by Scottish Index of Multiple Deprivation Decile



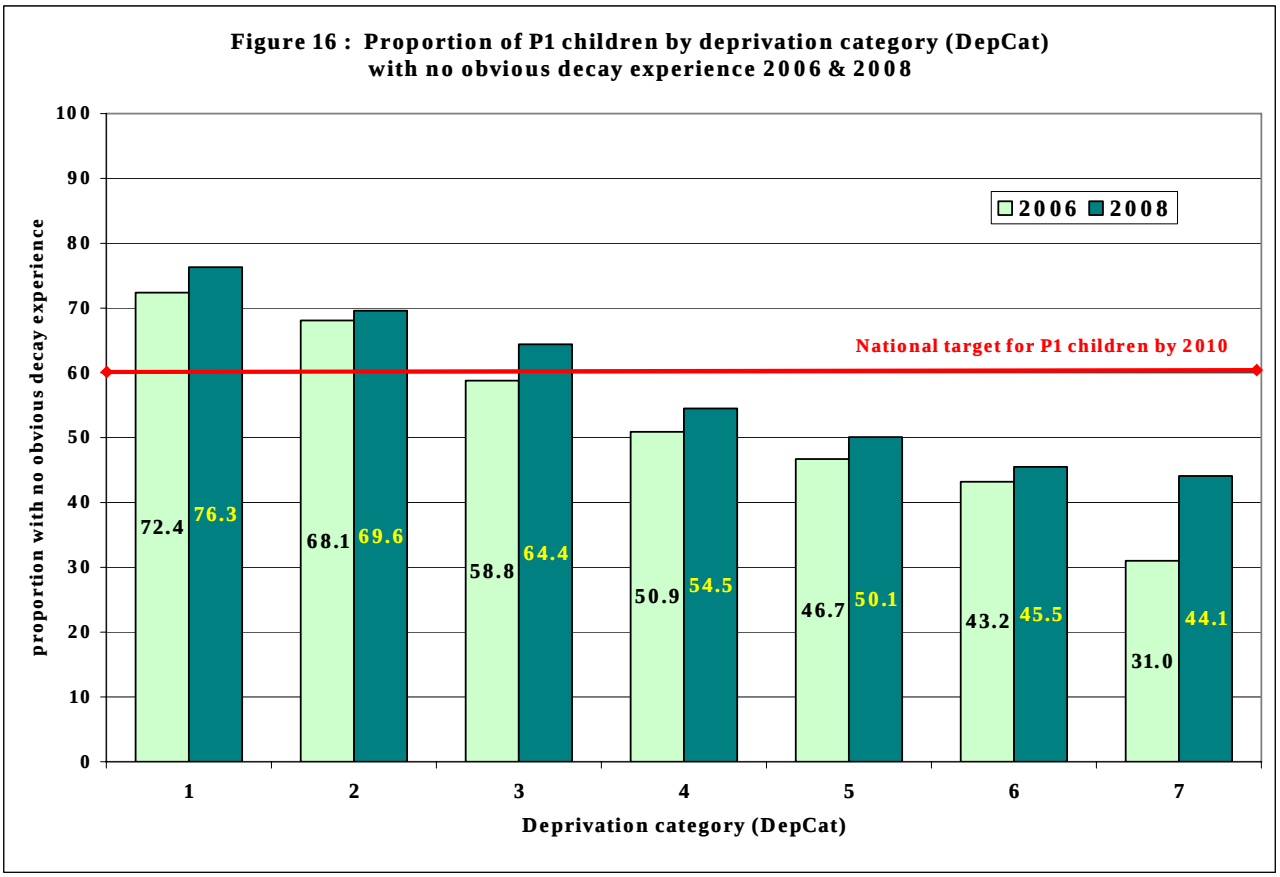
This clearly illustrates the gradient in dental health between those areas of less deprivation and those of more deprivation. In this decile classification, those children living in the most deprived area are still 20% beneath the target set for no obvious decay experience by the Scottish Government, while their peers in the more affluent areas have achieved, or will soon achieve, that national target.

Deprivation Category (DepCat) Data

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.

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 - measuring social deprivation, and dental decay in children.

Figure 16 compares the proportion of obvious decay experience found in the seven deprivation categories of the previous NDIP P1 report (2006) with that of the 2008 NDIP P1 report.



As can be seen, all seven deprivation categories have improved between 2006 and 2008 in relation to the percentage of P1 children in Scotland with no obvious decay experience. The largest improvement has occurred in DepCat 7, with a rise of 13 percentage points over the two-year period.

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

Acknowledgements

The National Dental Inspection Programme would not have been possible without the efforts of many people throughout Scotland who worked together to ensure its success.

The Programme is indebted to:

The participating schools, the children and their parents

Head teachers and staff of Letham, St. John's Roman Catholic and Our Lady's Roman Catholic Primary Schools in Perth, where the training and calibration exercises were conducted. Without their agreement, unstinting assistance and support in allowing part of their school day to be disrupted by so many dental staff, this report would not have been possible.

Community Dental Officers and Community Dental Service staff who conducted the inspections

Consultants in Dental Public Health and Chief Administrative Dental Officers Group

Dental Health Services Research Unit

Local Education Authorities of Scotland

NHS Boards of Scotland

Scottish Association of Clinical Dental Directors

Mr. J. Mackerrow & Mr S. Watson, Information Services Division

National Dental Inspection Programme
of Scotland
2008

ISBN 978-0-9550957-4-0