



*NATIONAL DENTAL INSPECTION PROGRAMME OF SCOTLAND*



*INFORMATION SERVICES DIVISION OF NHS NATIONAL SERVICES SCOTLAND*

# **NATIONAL DENTAL INSPECTION PROGRAMME**

# 2011

**REPORT OF THE 2011  
DETAILED NATIONAL DENTAL INSPECTION PROGRAMME  
OF PRIMARY 7 CHILDREN AND THE  
BASIC INSPECTION  
OF PRIMARY 1 AND PRIMARY 7 CHILDREN**

**PUBLISHED ON BEHALF OF  
THE SCOTTISH DENTAL EPIDEMIOLOGY COORDINATING COMMITTEE  
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## Table of Contents

<b><u>The 2011 National Dental Inspection Programme (NDIP)</u></b>	<b>1</b>
<u>Introduction</u>	1
<u>What does the NDIP <i>Detailed Inspection</i> consist of?</u>	1
<u>How many P7 children had a <i>Detailed Inspection</i>?</u>	1
<b><u>Part One - <i>Detailed Inspection Results</i></u></b>	<b>3</b>
<u>What proportion of P7 children in Scotland had no obvious decay experience in 2011?</u>	3
<u>What levels of obvious decay experience were seen in P7 children in 2011?</u>	3
<u>How has the dental health of P7 children in Scotland changed over time?</u>	4
<u>What are the obvious decay experience results for permanent teeth of P7 children in NHS Boards in Scotland?</u>	5
<u>What proportion of obvious decay experience among P7 children was treated with fillings?</u>	6
<u>Is there a link between area-based socioeconomic deprivation and poor dental health among P7 children in Scotland?</u>	6
<u>Dental health of the first permanent molar teeth</u>	8
<u>Conclusions</u>	9
<b><u>Appendix 1</u></b>	<b>10</b>
<u>What are the stages of tooth decay?</u>	10
<b><u>Appendix 2</u></b>	<b>11</b>
<u>National training and calibration course</u>	11
<b><u>Appendix 3</u></b>	<b>12</b>
<u>International comparisons</u>	12
<b><u>References</u></b>	<b>13</b>
<b><u>Acknowledgements</u></b>	<b>13</b>
<b><u>Part Two - <i>Basic Inspection Results</i></u></b>	<b>14</b>
<u>What does the NDIP <i>Basic Inspection</i> consist of?</u>	14
<u>Primary 1 Data</u>	14
<u>Primary 7 Data</u>	15
<u>Were there any difficulties experienced in collecting the <i>Basic Inspection</i> data?</u>	16
<u>How can the NDIP Programme results be applied to local NHS services, CHPs and Local Authorities?</u>	16
<b><u>List of Tables</u></b>	
<u>Table 1: Primary 7 populations and the number who received a <i>Detailed Inspection</i> by NHS Board across Scotland</u>	2
<u>Table 2: obvious decay experience in permanent teeth by NHS Board in Scotland in 2010/11</u>	5
<u>Table 3: overall obvious decay experience in permanent teeth of P7 children in Scotland</u>	5
<u>Table 4: Primary 1 children inspected by NHS Boards during the school year 2010/11</u>	14
<u>Table 5: Primary 7 children inspected by NHS Boards during the school year 2010/11</u>	15
<b><u>List of Figures and Diagram</u></b>	
<u>Figure 1: proportion of P7 children with no obvious decay experience</u>	3
<u>Figure 2: mean number of obviously decayed, missing and filled permanent teeth (D<sub>3</sub>MFT) of P7 children</u>	3
<u>Figure 3: comparison over time between the mean number of decayed, missing and filled permanent teeth (D<sub>3</sub>MFT) in the P7 population and the mean number of decayed, missing and filled permanent teeth in those children with decay (D<sub>3</sub>MFT&gt;0)</u>	4
<u>Figure 4: trends over time in the proportion of P7 children with no obvious decay experience</u>	4
<u>Figure 5: Care Index (FT/D<sub>3</sub>MFT x 100) for P7 children; 2005 to 2009</u>	6
<u>Figure 6: comparison between 2009 and 2011 of the proportion of P7 children with no obvious decay experience; by SIMD quintile</u>	7
<u>Figure 7: comparison between 2009 and 2011 of the proportion of P7 children with no obvious decay experience; by SIMD decile</u>	7
<u>Figure 8: mean number of obviously decayed, missing and filled first permanent molars of P7 children</u>	8
<u>Figure 9: proportion of D<sub>3</sub>MFT, fissure sealed and apparently sound, and apparently sound but NOT sealed, first permanent molars; by NHS Board</u>	8
<u>Figure 10: proportion of D<sub>3</sub>MFT, fissure sealed and apparently sound, and apparently sound but NOT fissure sealed, first permanent molars; by SIMD decile</u>	9
<u>Diagram 1: the various stages of tooth decay</u>	10
<u>Figure 11: proportions (%) of <i>Basic Inspection</i> letter distributed to P1 children during 2010/11</u>	15
<u>Figure 12: proportions (%) of <i>Basic Inspection</i> letter distributed to P7 children during 2010/11</u>	16

# **The 2011 National Dental Inspection Programme (NDIP) undertaken in the school year 2010/2011**

## ***Introduction***

It is important for a child's dental wellbeing to be 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 NHS Board levels so that reliable oral health information is available for planning and evaluating initiatives directed towards health improvements. The National Dental Inspection Programme (NDIP) aims to fulfil these functions by providing an essential source of information for monitoring the dental health of children in Scotland over time.

Two key child year groups are involved: 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).

This report focuses on the results of the *Detailed Inspection*. Limited information relating to the *Basic Inspection* can be found at the end of this Report.

In the school year 2010/2011, the *Detailed Inspection* programme involved P7 school children. An Executive Summary of the main findings can be found at <http://www.isdscotland.org/Health-Topics/Dental-Care/National-Dental-Inspection-Programme/>.

## ***What does the NDIP Detailed Inspection consist of?***

The *Detailed Inspection* involves a comprehensive assessment of the mouth of each child using a light, mirror and ball-ended probe. It involves recording the status of each tooth surface in accordance with international epidemiological conventions.

A tooth surface is only assessed as having 'obvious decay' if the disease process clinically appears to have penetrated dentine (i.e. the layer below the outer white enamel of the teeth). This is described internationally as decay at the D<sub>3</sub> level and includes *pulpal decay* (i.e. decay into the deeper pulp). The definition of decay used is in accordance with the British Association for the Study of Community Dentistry (BASCD) guidelines and international epidemiological conventions, thus allowing comparisons to be made with other countries in Europe and beyond. This is a different diagnostic level from that used by many dentists when examining patients in a dental surgery, i.e. dental check-ups. Moreover, the *Detailed Inspection* measures obvious decay into dentine when seen under school (rather than dental surgery) conditions. More information on the different stages of dental decay can be found in Appendix 1.

When the term 'obvious decay experience' (D<sub>3</sub>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.

Those undertaking the inspections attend a training and calibration course prior to the annual inspection process. Details of the course and of the calibration results can be found in Appendix 2.

The specific goals of the *Detailed Inspection* are to determine current levels of established tooth decay at national and NHS Board levels, and to determine the impact of deprivation on the dental health of children in Scotland. The results are weighted for each NHS Board by deprivation quintile [Scottish Index of Multiple Deprivation (SIMD<sup>1</sup>) 2009].

## ***How many P7 children had a Detailed Inspection?***

Each NHS Board identifies the number of Local Authority (LA) schools needed to obtain a representative sample of a given size from its P7 population. The sample sizes used provide adequate numbers to allow meaningful comparisons between NHS Boards. The sampling procedure for NDIP differs from previous surveys in so far as

whole classes are now selected to simplify the process for schools while ensuring that results reflect the P7 population in Scotland.

Table 1 shows that, between November 2010 and June 2011 (the period during the full school year in which the children were inspected), 13,256 children from Local Authority Schools across Scotland were inspected in detail. This represents 22.9% of the P7 population in Local Authority schools. Across all NHS Boards, the percentage of P7 children inspected ranged from 7.6% to 91.8%.

NHS Boards can choose to increase the sample size above minimum requirements to aid local planning needs, and some less populated Boards need to include large proportions to achieve statistically meaningful results.

The average age of the children inspected was 11.5 years of age. The range of ages across Scotland was 10.1 – 13.0 years.

**Table1: Primary 7 populations and the number who received a *Detailed Inspection* by NHS Board across Scotland**

<b>NHS Board</b>	<b>Primary 7 populations</b>	<b>Number of P7 children receiving a <i>Detailed Inspection</i></b>	<b>% of P7 population receiving a <i>Detailed Inspection</i></b>
<b>Ayrshire &amp; Arran</b>	4,156	1,218	29.3
<b>Borders</b>	1,248	302	24.2
<b>Dumfries &amp; Galloway</b>	1,725	326	18.9
<b>Fife</b>	4,028	1,605	39.8
<b>Forth Valley</b>	3,521	401	11.4
<b>Grampian</b>	6,020	1,026	17.0
<b>Greater Glasgow &amp; Clyde</b>	12,945	4,069	31.4
<b>Highland</b>	3,605	1,177	32.6
<b>Lanarkshire</b>	6,745	804	11.9
<b>Lothian</b>	8,730	1,249	14.3
<b>Orkney</b>	233	214	91.8
<b>Shetland</b>	294	264	89.8
<b>Tayside</b>	4,425	335	7.6
<b>Western Isles</b>	273	266	97.4
<b>Total for Scotland</b>	<b>57,948</b>	<b>13,256</b>	<b>22.9</b>

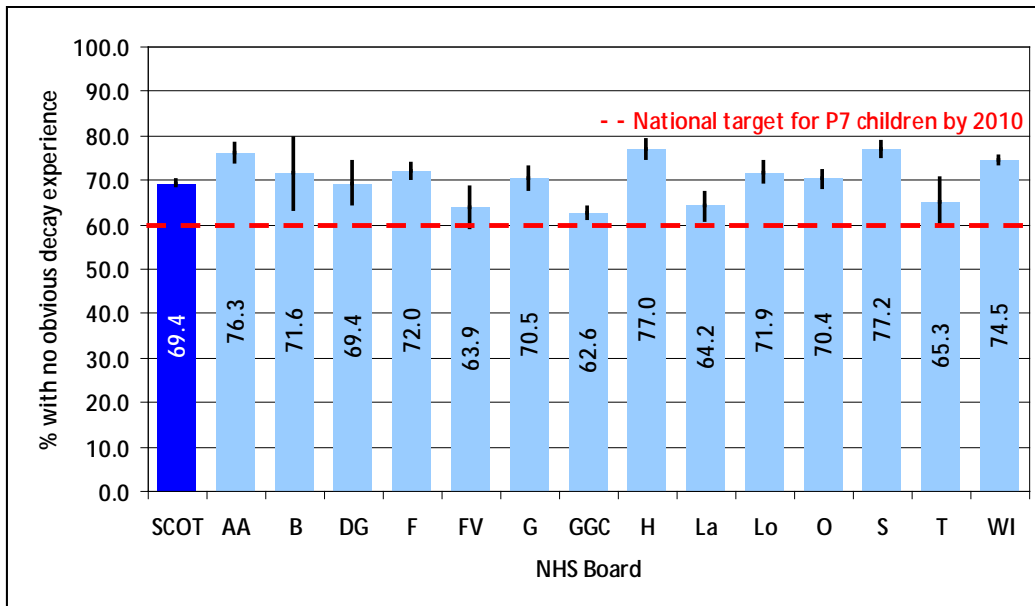
# PART ONE

## DETAILED INSPECTION RESULTS

### What proportion of P7 children in Scotland had no obvious decay experience in 2011?

Figure 1 shows the proportion of P7 children by NHS Board who showed no signs of obvious decay experience in their permanent teeth. Across Scotland, 69.4% of P7 children fell into this category, with a range of 62.6% to 77.2% across the fourteen NHS Boards. For the first time, all NHS Boards achieved the national target set for 2010 of 60% with no obvious decay experience.

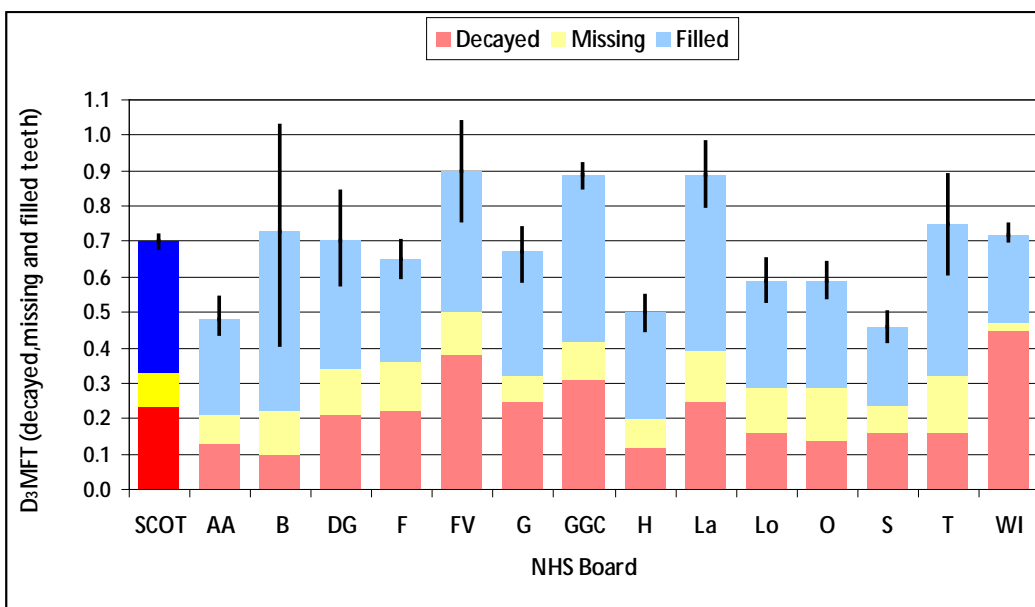
**Figure 1: proportion of P7 children with no obvious decay experience**



### What levels of obvious decay experience were seen in P7 children in 2011?

As shown in Figure 2, the average number of obviously decayed, missing and filled teeth across all P7 children inspected in Scotland was 0.70. This ranged from 0.46 to 0.90 across the 14 NHS Boards.

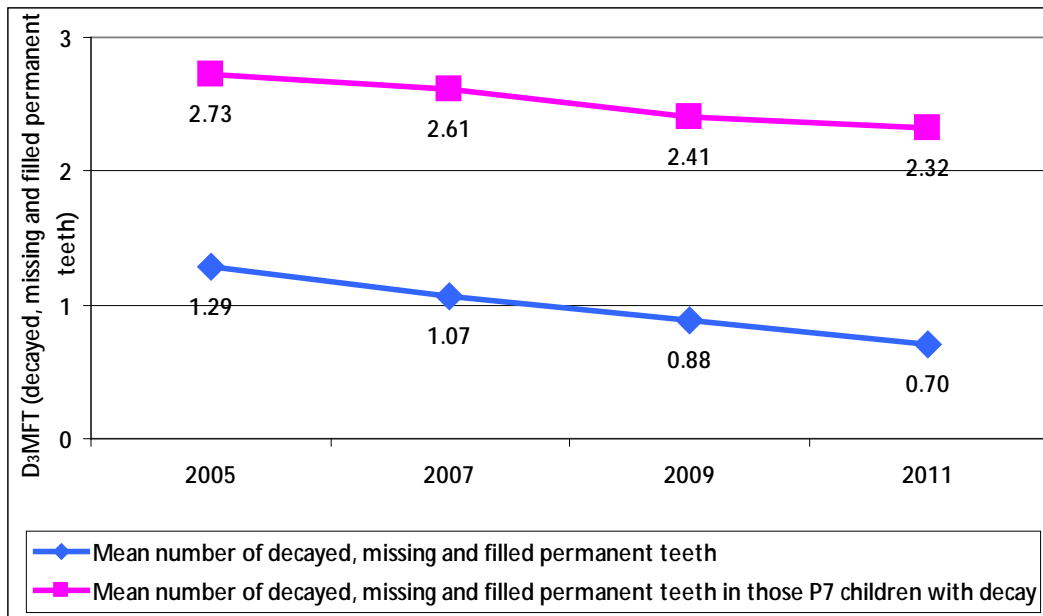
**Figure 2: mean number of obviously decayed, missing and filled permanent teeth (D<sub>3</sub>MFT) of P7 children**



### How has the dental health of P7 children in Scotland changed over time?

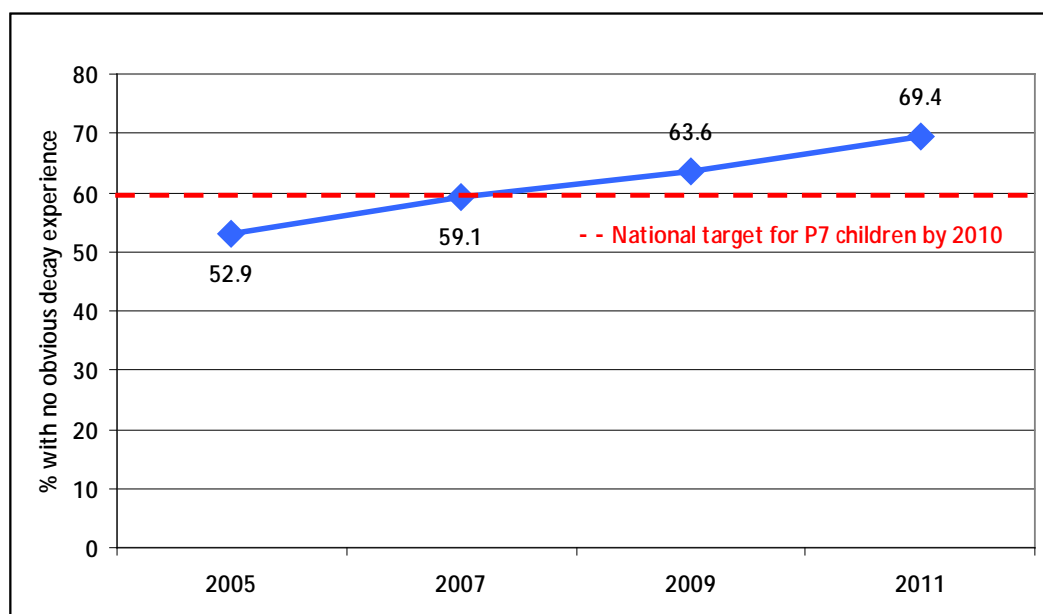
The changes over time in the mean number of decayed, missing and filled permanent teeth are shown in Figure 3 and illustrate a steady decline over the last six years in terms of mean  $D_3MFT$  for the P7 population as a whole and also for the subgroup with caries experience.

**Figure 3: comparison over time between the mean number of decayed, missing and filled permanent teeth ( $D_3MFT$ ) in the P7 population and the mean number of decayed, missing and filled permanent teeth in those children with decay ( $D_3MFT > 0$ )**



Similarly, the data in Figure 4 indicate a steady rise in the percentage of those with no obvious decay experience (i.e. a decline in the prevalence of decay).

**Figure 4: trends over time in the proportion of P7 children with no obvious decay experience**





*What are the obvious decay experience results for permanent teeth of P7 children in NHS Boards in Scotland?*

Table 2 provides details of the results for all 14 NHS Boards across Scotland. In this 2011 survey, 30.6% of P7 children in Scotland had obvious decay experience in their permanent teeth. For those children, the mean number of affected teeth was 2.32. This ranged across the Boards from 1.98 in Orkney to 2.84 in Western Isles. The number of teeth affected at the individual child level ranged from one to 12 teeth.

<b>NHS Board</b>	<b>% with no obvious decay experience in permanent teeth</b>	<b>Mean no. of decayed, missing and filled permanent teeth (D<sub>3</sub>MFT)</b>	<b>Mean no. of decayed permanent teeth (D<sub>3</sub>T)</b>	<b>Mean no. of missing permanent teeth (MT)</b>	<b>Mean no. of filled permanent teeth (FT)</b>	<b>For those with decay, the mean no. of decayed, missing and filled permanent teeth (D<sub>3</sub>MFT&gt;0)</b>
<b>Ayrshire &amp; Arran</b>	76.3	0.49	0.13	0.08	0.27	2.06
<b>Borders Dumfries &amp; Galloway</b>	71.6	0.72	0.10	0.12	0.51	2.22
<b>Fife</b>	69.4	0.71	0.21	0.13	0.36	2.32
<b>Forth Valley</b>	72.0	0.65	0.22	0.14	0.29	2.31
<b>Grampian</b>	63.9	0.90	0.38	0.12	0.40	2.57
<b>Greater Glasgow &amp; Clyde</b>	70.5	0.67	0.25	0.07	0.35	2.28
<b>Highland</b>	62.6	0.89	0.31	0.11	0.47	2.40
<b>Lanarkshire</b>	77.0	0.50	0.12	0.08	0.30	2.16
<b>Lothian</b>	64.2	0.89	0.25	0.14	0.50	2.50
<b>Orkney</b>	71.9	0.59	0.16	0.13	0.30	2.14
<b>Shetland</b>	70.4	0.59	0.14	0.15	0.30	1.98
<b>Tayside</b>	77.2	0.46	0.16	0.08	0.22	2.02
<b>Western Isles</b>	65.3	0.75	0.16	0.16	0.43	2.19
<b>Scotland</b>	74.5	0.72	0.45	0.02	0.25	2.84
<b>Scotland</b>	69.4	0.70	0.23	0.10	0.37	2.32

Table 3 summarises the results at Scotland level and the ranges across NHS Boards. Overall, 12.8% of P7 children inspected had current obvious decay experience, i.e. D<sub>3</sub>T>0.

	<b>%</b>	<b>NHS Boards</b>
Free of obvious decay experience at the dentinal level (D <sub>3</sub> MFT = 0)	69.4	62.6 – 77.2
With obvious decay experience, D <sub>3</sub> MFT>0 (as per BASCD)	30.6	22.8 – 37.4
With 'current decay', D <sub>3</sub> >0 (as per BASCD)	12.8	6.8 – 18.2
Care index (FT/D <sub>3</sub> MFT)	52.8	34.7 – 70.8
	<b>Mean</b>	<b>NHS Boards</b>
Obvious decay experience (D <sub>3</sub> MFT) across Scotland	0.70	0.46 – 0.90
Decayed teeth (D <sub>3</sub> T) across Scotland	0.23	0.10 – 0.45
Missing teeth (MT) across Scotland	0.10	0.02 – 0.16
Filled teeth (FT) across Scotland	0.37	0.22 – 0.51
Decayed, missing and filled teeth for those with obvious decay experience (D <sub>3</sub> MFT>0)	2.32	1.98 – 2.84

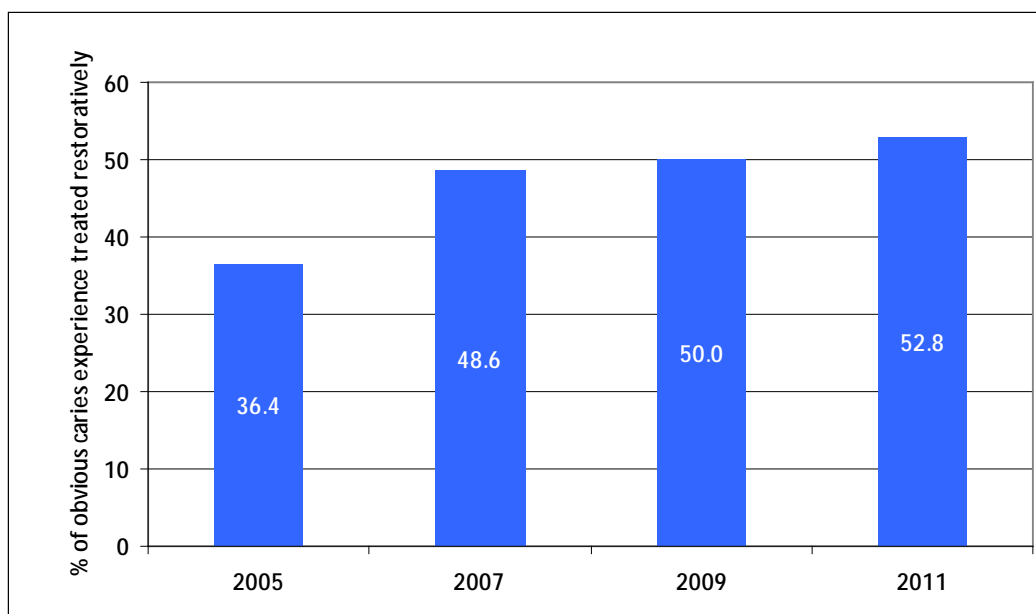
### *What proportion of obvious decay experience among P7 children was treated with fillings?*

When the decay process is clinically assessed to have reached the dentine layer of the permanent tooth (i.e. D<sub>3</sub> stage), this is normally considered to be an indication that restorative treatment is required.

The Care Index is used to describe the proportion of obvious decay experience in a population that has been treated restoratively and is expressed as the number of filled teeth divided by the number of obviously decayed, missing and filled teeth, multiplied by 100 [(FT/D<sub>3</sub>MFT) x 100].

Figure 5 shows the Care Index values obtained for the last four P7 surveys. Only a very limited improvement in the Care Index has occurred over the past six years with, on average, one third of teeth with obvious caries experience having untreated decay in the 2011 survey.

**Figure 5: Care Index (FT/D<sub>3</sub>MFT x 100) for P7 children; 2005 to 2011**



### *Is there a link between area-based socioeconomic deprivation and poor dental health among P7 children in Scotland?*

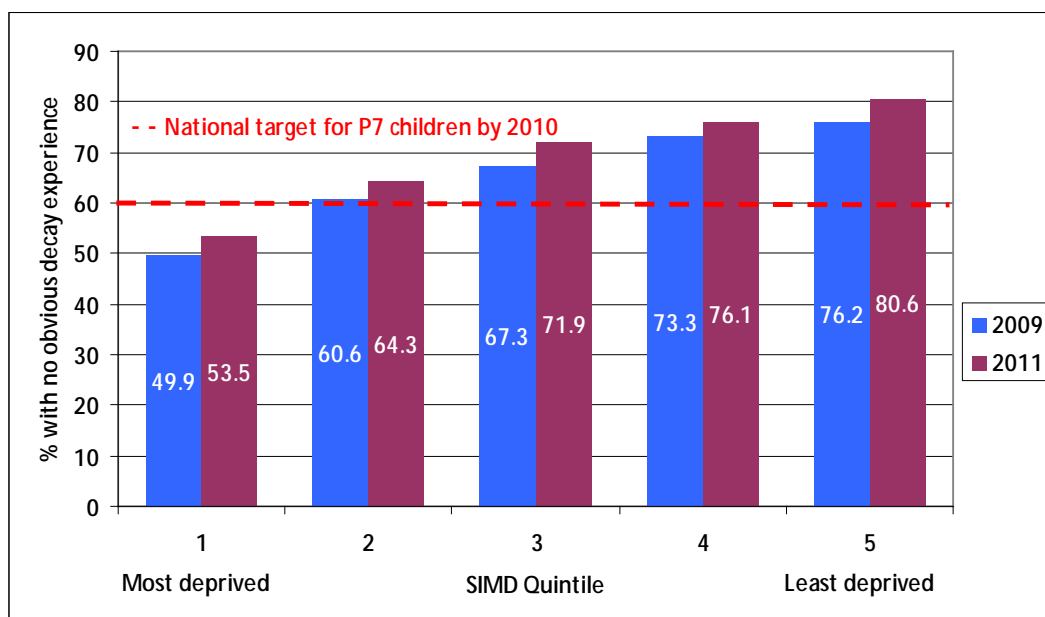
All NDIP surveys on deprivation now report using the Scottish Index of Multiple Deprivation (SIMD). The SIMD classification identifies small area concentrations of multiple deprivation and is presented at data zone level based on postcode unit information. It has seven domains (income, employment, education, 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 6 graphically illustrates the difference in dental health between P7 children in the different SIMD quintiles. Each fifth of the population showed an improvement in dental health since the last P7 survey. Those in quintiles 2, 3, 4 and 5 have reached the 2010 national target of 60% with no obvious decay experience, while quintile 1 – representing the most deprived areas – fell short, with only 53.5% of P7 children having no obvious decay experience.

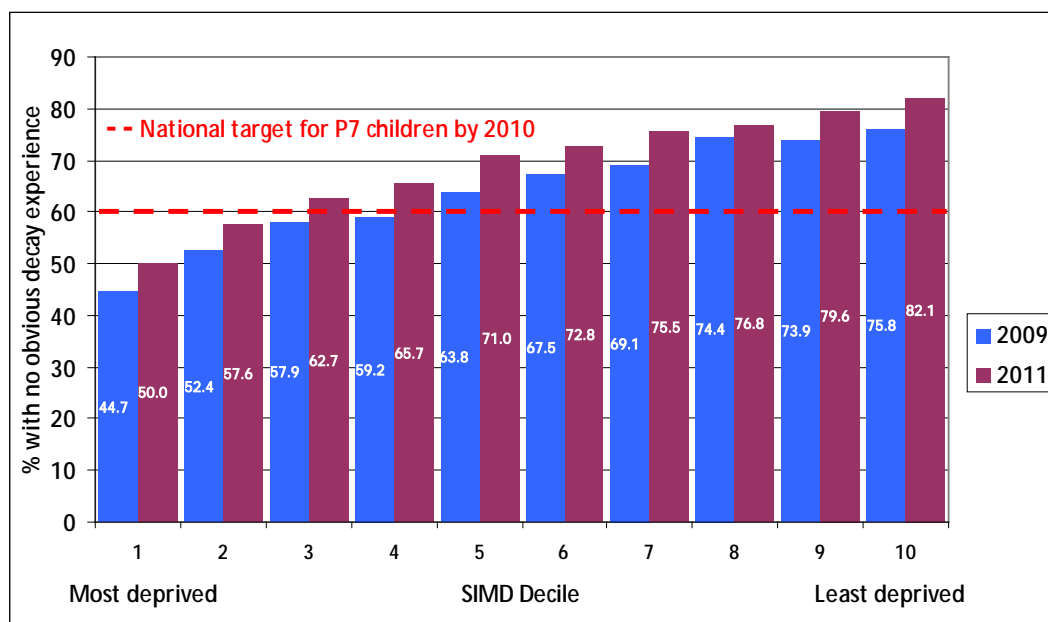
As a measure of health inequality, the difference in values between those in quintiles 1 and 5 was 26.3 percentage points in 2009 and 27.1 percentage points in 2011.

**Figure 6: comparison between 2009 and 2011 of the proportion of P7 children with no obvious decay experience; by SIMD quintile**



The SIMD decile classification has 10 divisions of deprivation from 1 (most deprived) to 10 (least deprived), and the results for 2009 and 2011 are shown in Figure 7.

**Figure 7: comparison between 2009 and 2011 of the proportion of P7 children with no obvious decay experience; by SIMD decile**



Between 2009 and 2011, each socioeconomic decile of the P7 population showed an improvement in the percentage of children with no obvious caries experience, and now only those children in the two most deprived deciles have not reached the 2010 target of 60% with no obvious decay experience.

The difference in values between the two ends of the decile range was 31.1 and 32.1 percentage points in 2009 and 2011 respectively.

**Dental health of the first permanent molar teeth**

Across Scotland, the percentage of P7 children with no obvious decay experience in their first permanent molars was 70.4%. This ranged from 63.6% in Greater Glasgow & Clyde to 78.3% in Highland. Figure 8 shows the mean D<sub>3</sub>MFT for first permanent molars for Scotland and for each NHS Board.

**Figure 8: mean number of obviously decayed, missing and filled first permanent molars of P7 children**

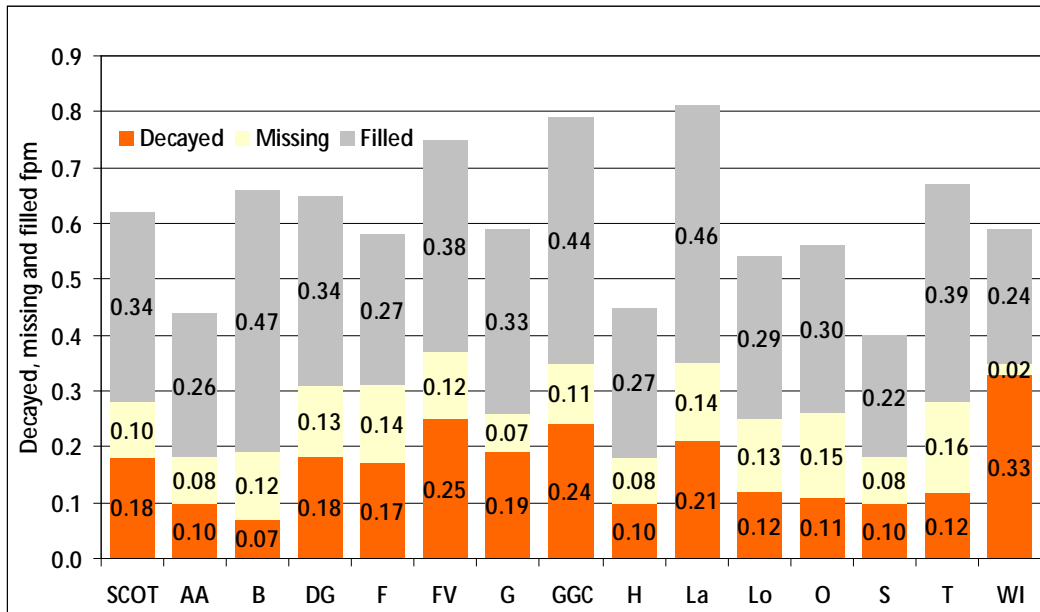
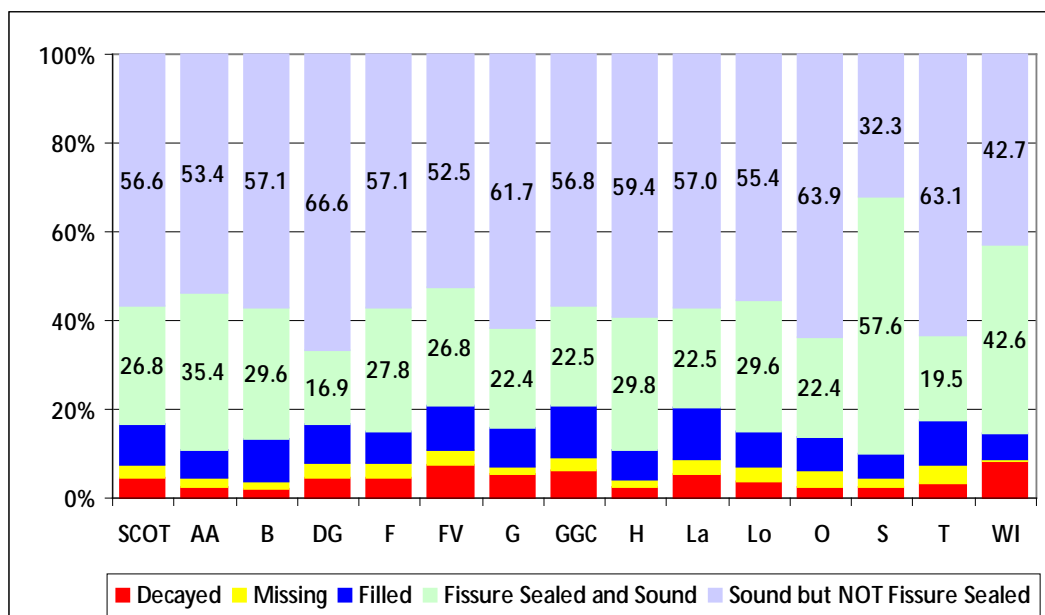


Figure 9 shows the proportion of decayed, missing and filled first permanent molar teeth and the proportion that are apparently sound or sound and fissure sealed. The proportion of first permanent molars sound and fissure sealed varied across NHS Boards from 16.9% in Dumfries & Galloway to 57.6% in Shetland.

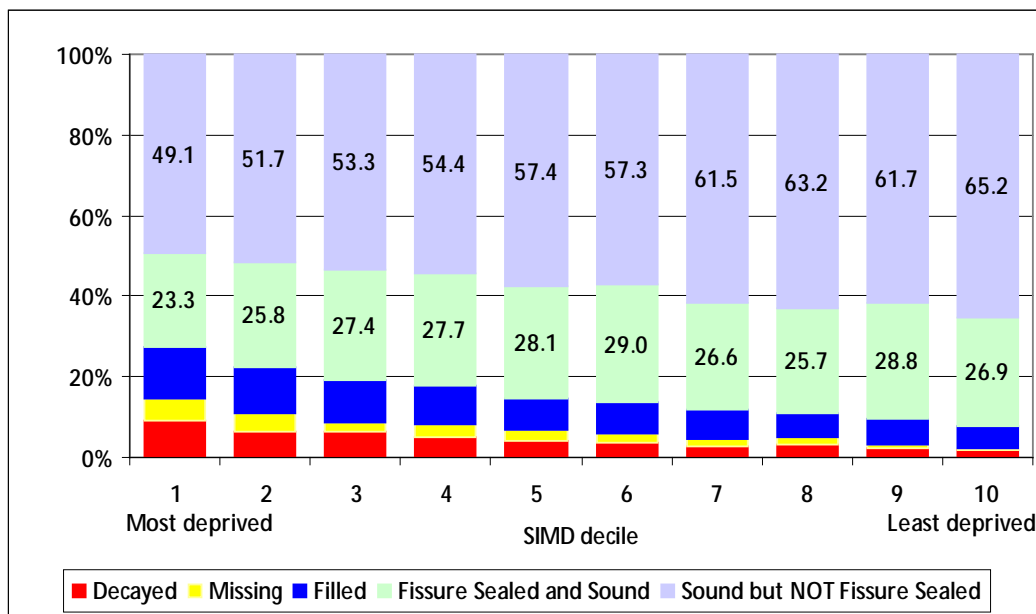
Future work will examine the proportion of surfaces with untreated decay or fillings in first permanent molars affecting only the occlusal surface. This will help to determine the potential benefit from further implementation of guidance relating to fissure sealants in dental primary care.

**Figure 9: proportion of D<sub>3</sub>MFT, fissure sealed and apparently sound, and apparently sound but NOT sealed, first permanent molars; by NHS Board**



A similar graph is illustrated in Figure 10, but this time illustrating the status of first permanent molars by SIMD decile. As expected, the proportion of first permanent molars affected by dental disease increases with increasing level of deprivation. The proportion of teeth fissure sealed and apparently sound is relatively similar across the socioeconomic deciles. However, the lowest value is to be found in the tenth of the P7 population with the highest level of deprivation.

**Figure 10: proportion of D<sub>3</sub>MFT, fissure sealed and apparently sound, and apparently sound but NOT fissure sealed, first permanent molars; by SIMD decile**



### Conclusions

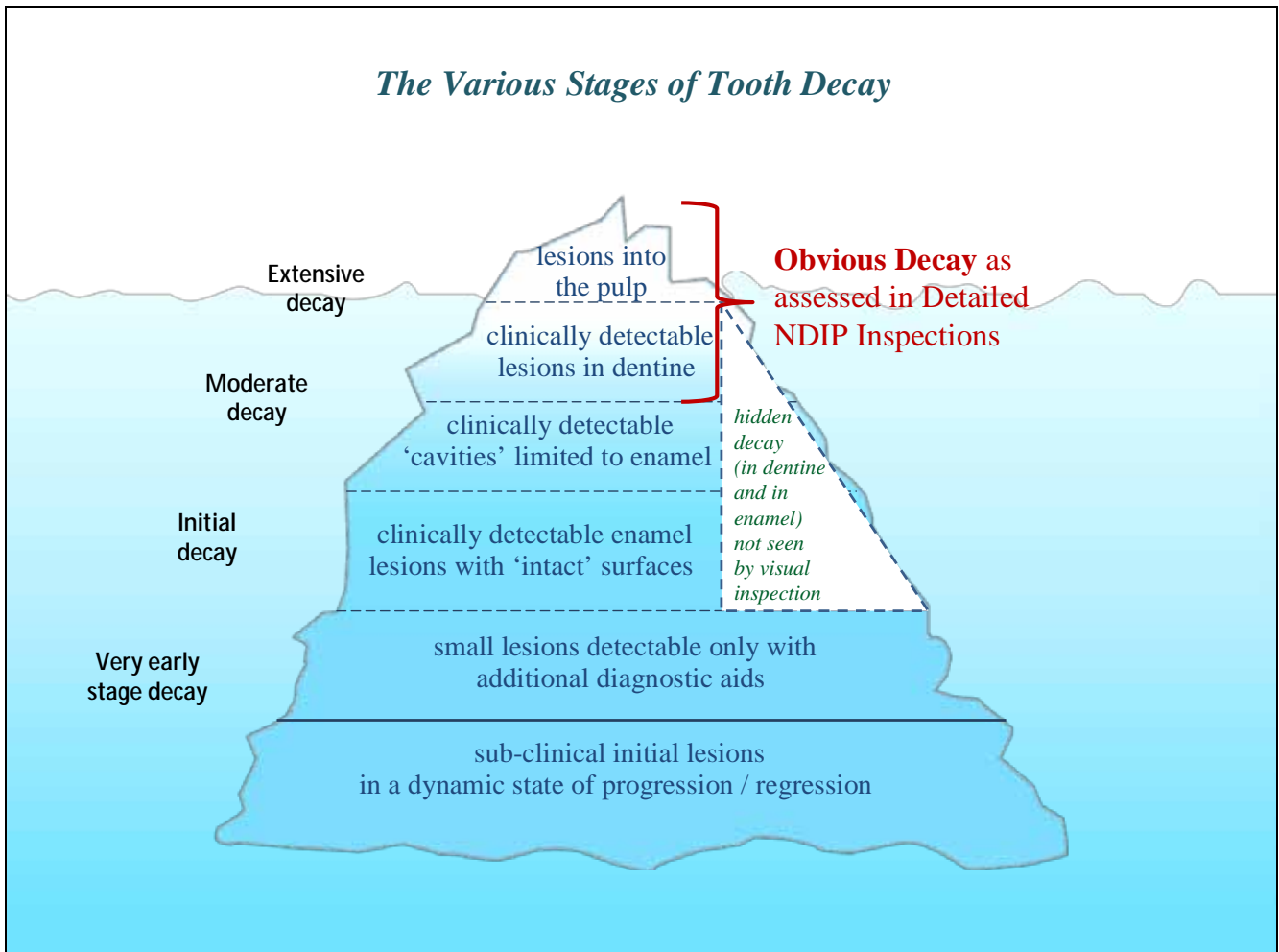
- The oral health of P7 children in Scotland continues to show improvement. The cohort of children inspected in 2010/11 was one of the earliest to have had access to the national universal nursery tooth brushing programme from 3 years of age.
- It is expected that this level of dental health improvement will be maintained as the *Childsmile*<sup>2</sup> Programme is further refined and implemented at NHS Board level.
- P7 children in all SIMD quintiles and SIMD deciles showed an improvement in oral health compared to those from 2008/09. However, clear health inequalities remain. The proportionate universalism approach advocated by the Marmot Review of 2010<sup>3</sup> will continue to be adopted in oral health improvement programmes to reduce the gap between the most and least deprived.
- The proportion of teeth with obvious decay experience that had fillings (Care Index) was just over 50%, with one third of these teeth presenting with unrestored decay into dentine. Additionally, the proportion of first permanent molars with fissure sealants was relatively low, particularly in the most deprived groups. The findings show the need for the promotion and implementation of the SDCEP guidance document<sup>4</sup> on the prevention and management of caries in children.

## APPENDIX 1

### *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. The early stages of decay occur at a subclinical level and cannot be detected by the naked eye. As decay progresses, it can be detected visually: first on the outer surface of the tooth (enamel layer); then, with further progression, the lesion is clinically detectable in the dentine layer under the enamel. It is decay which has reached this stage that is recorded by the dentists undertaking the NDIP inspections.

**Diagram 1**



## APPENDIX 2

### *National training and calibration course*

The training and calibration course for the 2011 *Detailed Inspection* of P7 children in Scotland was held in Edinburgh in November 2010. The training course was organised by NHS Lothian and NHS Health Scotland.

Mandatory training and calibration was run over two separate courses to accommodate the 44 inspection teams (dentist and dental nurse) who came from all 14 NHS Boards. Training involved sessions on inspection procedures, tooth/surface codes and diagnostic criteria based on the British Association for the Study of Community Dentistry (BASCD) Trainers' Pack<sup>5</sup>. Clinical training sessions were then undertaken on P7 schoolchildren, followed by the calibration sessions on a further group of P7 children. Calibration sessions involved each inspection team examining the same 10 children.

Analyses were undertaken by staff from the Community Oral Health Section, University of Glasgow, supported by colleagues from NHS Lothian and from the Information Services Division of NHS National Services Scotland. Inter-examiner agreement was assessed using the percentage agreement and Kappa statistic assessed at the patient level on dmft and separately for dt, mt, and ft components.

Cohen Kappa estimates agreement which is considered<sup>6</sup>:

- poor if:  $\text{Kappa} \leq 0.20$
- fair if:  $0.21 \leq \text{Kappa} \leq 0.40$
- moderate if:  $0.41 \leq \text{Kappa} \leq 0.60$
- substantial if:  $0.61 \leq \text{Kappa} \leq 0.80$
- good if:  $\text{Kappa} > 0.80$

All 44 inspection teams calibrated successfully, with percentage agreement ranging from 73% to 100%; Kappa estimates for D<sub>3</sub>MFT scores at the patient level did not drop below moderate. For 10 inspection teams, where the Kappa was lower than substantial (due to disagreement on not more than four patients), examiner groups received local detailed feedback to ensure awareness of variation.

Future plans include investigation of the relationship between calibration data at the patient and tooth level.

## APPENDIX 3

### *International comparisons*

According to the World Health Organisation (WHO), dental caries is still a major oral health problem in most high- and middle-income countries, affecting 60-90% of schoolchildren and the vast majority of adults. The WHO Global Oral Health Database and the WHO Oral Health Country/Area Profile Programme<sup>7</sup> [<http://www.mah.se/CAPP/>] provide information on trends in dental caries, mainly among 12-year-old children, from 1937.

Recent figures give insight into how dental caries prevalence compares across a large number of countries. However, as some results are from national surveys with representative samples – while others relate only to small, local surveys – caution is required in use of the raw data to make international comparisons. It is also necessary to understand the public health aims behind the WHO ‘basic methods’ diagnostic criteria employed in most datasets in the databank, and these surveys are intended to provide only an overview of caries prevalence.

Comparative data (as at 2007) on international prevalence and trends in 12-year-olds are available on the Scottish Public Health Observatory (ScotPHO) website<sup>8</sup> at [http://www.scotpho.org.uk/home/Healthwell-beinganddisease/oralhealth/Oral\\_health\\_data/Children\\_international.asp](http://www.scotpho.org.uk/home/Healthwell-beinganddisease/oralhealth/Oral_health_data/Children_international.asp) (pages to be updated shortly).



## References

1. Scottish Index of Multiple Deprivation 2009. Available at <http://www.scotland.gov.uk/topics/statistics/SIMD>
2. Childsmile. Available at <http://www.child-smile.org.uk>
3. Strategic Review of Health inequalities in England Post 2010. Fair Society, Healthy Society. Available at <http://www.marmotreview.org/AssetLibrary/pdfs/Reports/FairSocietyHealthyLives.pdf>
4. Scottish Dental Clinical Effectiveness Programme. Prevention and Management of Dental Caries in Children (published April 2010). Available at <http://www.sdcep.org.uk/index.aspx?o=2332>
5. Mitropoulos C, Pitts NB, Deery C. BASCD Trainers pack for caries prevalence studies, 1992/93. Dundee: University of Dundee, 1992.
6. Landis JR, Koch GG. The measurement of observer agreement for categorical data. *Biometrics* 1977; 33: 159-174.
7. The WHO Global Oral Health Database and the WHO Oral Health Country/Area Profile Programme. <http://www.mah.se/CAPP/>
8. Scottish Public Health Observatory SCOTPHO website [http://www.scotpho.org.uk/home/Healthwell-beinganddisease/oralhealth/Oral\\_health\\_data/Children\\_international.asp](http://www.scotpho.org.uk/home/Healthwell-beinganddisease/oralhealth/Oral_health_data/Children_international.asp)

## 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.

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- NHS Boards in Scotland.
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- Consultants in Dental Public Health of Scotland and Chief Administrative Dental Officers' Group.
- Scottish Association of Community Dental Directors.

## PART TWO

### BASIC INSPECTION RESULTS

#### What does the NDIP Basic Inspection consist of?

The *Basic Inspection* involves a simple assessment of the mouth of the child using a light, mirror and ball-ended probe.

The dental status of each child is then assigned to one of three categories, depending on the level of dental health and treatment need observed, and parents/carers are advised of this by letter.

The information in the letter explains the state of dental health observed in the mouth of the child at the time of the inspection (it varies slightly according to whether a P1 or a P7 child has been inspected).

The letter types 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 NHS oral health improvement programmes and to assist in the development of local dental services.

#### Primary 1 Data

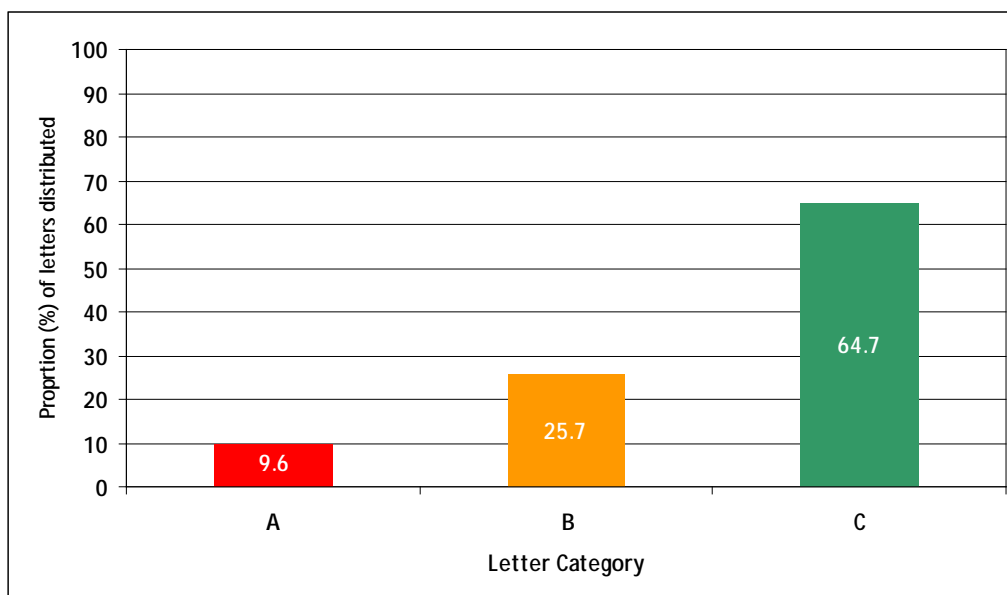
During 2010/11, all P1 classes of Scottish Local Authority schools were invited to participate in the Programme. The *Basic Inspections* were conducted in primary schools in all NHS Board areas, and overall 47,712 P1 children were inspected (Table 4).

This represents 85.6% of P1 children who attended mainstream Local Authority schools across Scotland in the 2010/11 school year and whose parents/carers were advised by letter of the oral health of their child.

NHS Board	Total no. of P1 children in Local Authority schools	Total no. of P1 children inspected	Proportion (%) of P1 children inspected	Proportion (%) of A Letters issued	Proportion (%) of B Letters issued	Proportion (%) of C Letters issued
Ayrshire & Arran	3,833	3,443	89.8	6.4	28.6	65.0
Borders	1,231	1,000	81.2	4.6	19.2	76.2
Dumfries & Galloway	1,486	1,207	81.2	8.9	26.3	64.8
Fife	3,962	3,274	82.6	7.4	28.0	64.5
Forth Valley	3,300	2,930	88.8	5.3	28.7	66.0
Grampian	5,863	4,860	82.9	9.1	21.4	69.5
Greater Glasgow & Clyde	12,982	11,173	86.1	13.7	28.3	57.9
Highland	3,137	2,637	84.1	4.8	26.4	68.8
Lanarkshire	6,516	5,764	88.5	11.9	24.8	63.3
Lothian	8,518	7,167	84.1	9.2	22.1	68.7
Orkney	199	180	90.5	3.9	24.4	71.7
Shetland	242	222	91.7	5.0	20.3	74.8
Tayside	4,252	3,641	85.6	9.0	26.4	64.5
Western Isles	242	214	88.4	5.1	27.1	67.8
<b>SCOTLAND</b>	<b>55,763</b>	<b>47,712</b>	<b>85.6</b>	<b>9.6</b>	<b>25.7</b>	<b>64.7</b>

The relative frequency distribution of the respective letters which were issued to parents/carers of P1 children across Scotland in 2010/11 is detailed in Figure 11. 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 11: proportions (%) of *Basic Inspection* letter distributed to P1 children during 2010/11**



### Primary 7 Data

In total, 46,221 P7 children received a *Basic Inspection*. This represents 81.1% of P7 children attending mainstream Local Authority schools across Scotland (Table 5).

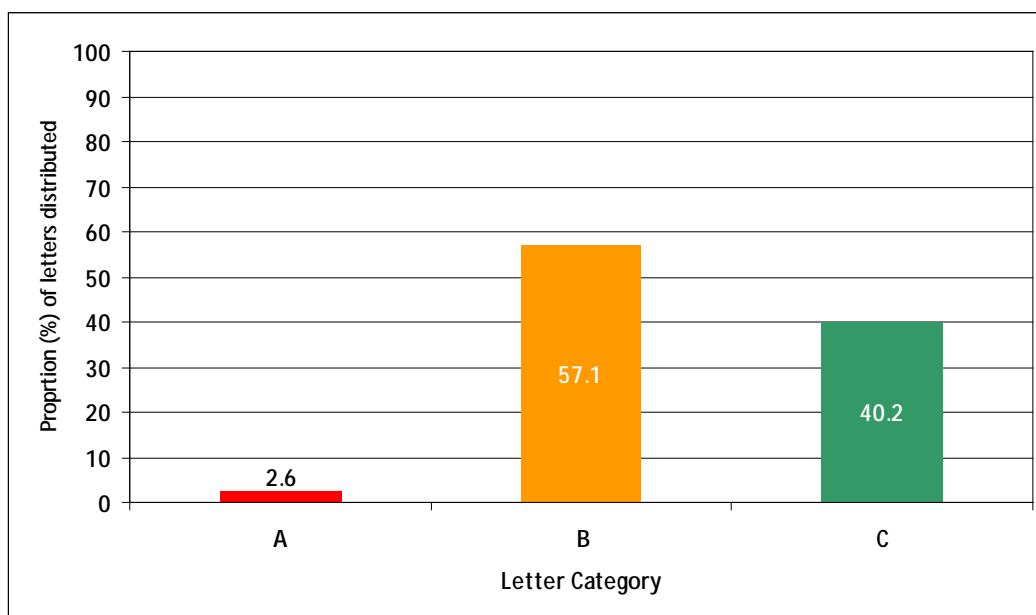
As with P1 children, parents/carers of those P7 children who received a *Basic Inspection* were advised by letter of the oral health of their child.

**Table 5: Primary 7 children inspected by NHS Boards during the school year 2010/11**

NHS Board	Total no. of P7 children in Local Authority schools	Total no. of P7 children inspected	Proportion (%) of P7 children inspected	Proportion (%) of A Letters issued	Proportion (%) of B Letters issued	Proportion (%) of C Letters issued
Ayrshire & Arran	3,895	3,459	88.8	2.6	55.4	41.9
Borders	1,234	1,064	86.2	1.1	51.3	47.6
Dumfries & Galloway	1,539	1,173	76.2	1.7	49.9	48.4
Fife	4,089	3,007	73.5	1.9	45.8	52.3
Forth Valley	3,481	2,664	76.5	3.4	52.7	43.9
Grampian	6,016	4,590	76.3	2.0	60.2	37.8
Greater Glasgow & Clyde	12,539	10,756	85.8	3.8	65.3	30.9
Highland	3,592	2,809	78.2	1.7	56.6	41.7
Lanarkshire	6,826	5,816	85.2	2.8	55.9	41.3
Lothian	8,800	6,628	75.3	2.5	54.7	42.9
Orkney	235	216	91.9	1.9	74.1	24.1
Shetland	264	264	100.0	3.8	47.0	49.2
Tayside	4,162	3,511	84.4	1.5	53.4	45.1
Western Isles	314	264	84.1	2.3	65.5	32.2
<b>SCOTLAND</b>	<b>56,986</b>	<b>46,221</b>	<b>81.1</b>	<b>2.6</b>	<b>57.1</b>	<b>40.2</b>

The relative frequency distribution of the respective letters which were issued to parents/carers of P7 children across Scotland in 2010/11 is shown 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.

**Figure 12: proportions (%) of *Basic Inspection* letter distributed to P7 children during 2010/11**



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

A range of logistical problems is usually experienced by NHS Boards throughout the year as they try to deliver comprehensive inspection coverage of all schools, mainly due to limited availability of salaried Community Dental Services’ workforce and conflicting service demands. During the winter of 2010/11, prolonged adverse weather conditions seriously affected all Boards’ abilities to visit schools, record Inspection findings and process data prior to transmission.

NHS Boards, CHPs and Local Authorities across Scotland continue to work in partnership to improve the NDIP programme. For the interpretation of any local results contained in Tables 4 and 5, readers are advised to contact the NHS Board concerned. Although the aim is for all P1 and P7 children to receive a *Basic Inspection*, it is improbable that this will be conducted on every child within all participating schools (if parental permission has not been given, or if a child is unable/unwilling to co-operate or is absent on the day of the inspection, etc.).

Variation in the size of the 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 a useful monitoring tool in highlighting areas that require health promotion or dental services input. Local Authorities may also receive anonymised and aggregated data at 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, sustained progress is being seen at each of the monitoring levels and further improvement in the level of dental health is expected in both nursery and primary schools.