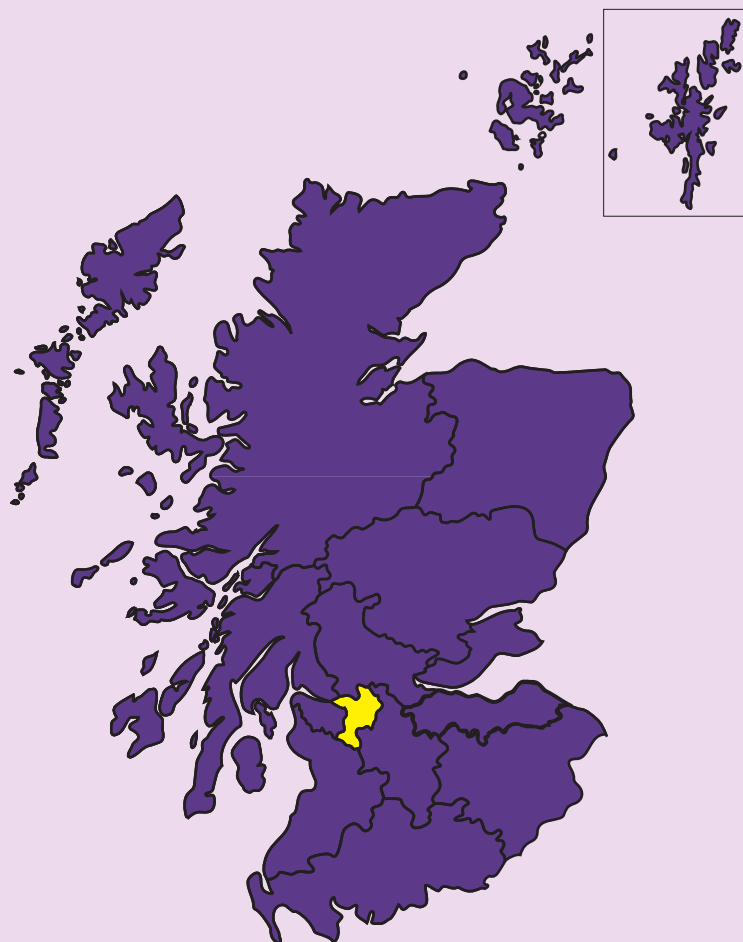


**SCOTTISH HEALTH BOARDS'**  
**DENTAL EPIDEMIOLOGICAL PROGRAMME**  
**The dental health of 12 year olds in Greater Glasgow**  
**2000 - 2001**



Prepared by  
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## Introduction

Since 1987, the Scottish Health Boards' Dental Epidemiological Programme has produced robust data on the dental health of the Scottish school children in annual surveys of selected age groups using national standardised protocols. This is the fourth survey of 12 year olds in this series of dental surveys. For the current year there have been several Health Board areas where great difficulty has been experienced in gathering the necessary representative and random sample of children for examination due to varying interpretations of the Data Protection Act by both Education Authorities and local Caldicott Guardians. This has led to compromised samples in the affected areas with subsequent loss in the uniformity of an overall Scottish sample. As a result of this, the national SHBDEP Report has been suspended for the current year. This report details the results for only the Greater Glasgow Health Board area in which the standard methodology of sampling, national calibration and dental examination remained unchanged.

## 2000/2001 Report

The aim of this year's survey was to determine current levels of decay in 12 year olds in Greater Glasgow and to assess levels of oral cleanliness, the presence of developmental defects of enamel and the impact of defects and malocclusions as perceived by the children themselves. In keeping with the Scottish Executive's objective of reducing inequalities in health, the impact of deprivation on the dental health of young adolescents is illustrated.

TABLE 1

Secondary I population, number in sample, number and percentage of population examined and number examined by deprivation category (DEPCAT).

	Secondary I Population	Sample	Examined	Examined as % of population
Greater Glasgow	10600	1656	1450	13.7
DEPCAT 1	n/a	n/a	192	n/a
DEPCAT 2	n/a	n/a	136	n/a
DEPCAT 3	n/a	n/a	137	n/a
DEPCAT 4	n/a	n/a	113	n/a
DEPCAT 5	n/a	n/a	112	n/a
DEPCAT 6	n/a	n/a	269	n/a
DEPCAT 7	n/a	n/a	419	n/a

The results reported here are for Greater Glasgow Health Board. The examinations took place between October 2000 and February 2001 in secondary schools in the health board area.

As shown in **Table 1**, 1450 children were examined representing 13.7% of the Secondary I population. The number of children examined in each deprivation category is also shown.

Figures for decay ( $D_3$ ) record dental decay (caries) which clinically appears to have reached dentine. This diagnostic threshold is routinely used in epidemiological surveys and may differ from that used in clinical practice. No additional diagnostic aids such as radiographs were employed during the survey.

**Table 2** below shows the overall results for Greater Glasgow for the mean number of decayed ( $D_3$ ), missing (M) and filled (F) permanent teeth and information about the presence of sealants and sealant restorations. The mean number of decayed, missing and filled teeth of 2.03 for Greater Glasgow has fallen from the figure of 2.32 in the last survey (Pitts, Davies & Fyffe, 1997).

Also shown in **Table 2** are different ways to group children with respect to their caries status. Firstly, the traditional measure of "zero caries" used by many Health Boards is given. The second measure is the proportion of children with caries experience in accordance with the British Association for the Study of Community Dentistry guidelines, (Mitropoulos, Pitts & Deery, 1992 ; Pitts (ed)1997). Thirdly, the results are expressed as the proportion of children with dental decay at the time of the survey examinations. This demonstrates the number of children suffering from untreated decay which most dentists would agree warrants treatment (filling or extraction). These results suggest that in Greater Glasgow 39% of children examined fell into this category in 2000/2001.

**TABLE 2**

Overall D<sub>3</sub>MFT results for Greater Glasgow, incorporating data by deprivation category (DEPCAT).

	Greater Glasgow	DEPCAT						
		1	2	3	4	5	6	7
age (in years)	12.28	12.26	12.26	12.27	12.27	12.27	12.30	12.28
"sound" teeth (code G)	20.73	21.51	20.88	20.85	19.63	21.20	20.89	20.47
"sound" plus sealed teeth (codes G+\$)	22.07	23.14	22.40	22.42	21.88	22.12	22.01	21.51
sealants/sealant restorations (code N+\$)*	1.37	1.64	1.57	1.61	2.30	0.94	1.15	1.07
decayed teeth (D <sub>3</sub> )	0.89	0.31	0.65	0.66	0.70	1.11	0.84	1.42
of which unrestorable teeth C <sub>3</sub>	0.045	0.005	0.007	0.015	0.027	0.036	0.048	0.095
Range of means (C <sub>3</sub> )	0 - 4	0 - 1	0 - 1	0 - 1	0 - 3	0 - 1	0 - 2	0 - 4
missing teeth (M)	0.21	0.01	0.07	0.12	0.15	0.23	0.28	0.35
filled teeth (F)	0.93	0.51	0.65	0.99	0.93	1.09	0.96	1.14
D <sub>3</sub> FT (D <sub>3</sub> +F)	1.82	0.82	1.30	1.65	1.63	2.20	1.80	2.56
D <sub>3</sub> MFT (D <sub>3</sub> +M+F)	2.03	0.82	1.38	1.77	1.78	2.43	2.08	2.91
	%	%	%	%	%	%	%	%
With "zero caries" D <sub>3</sub> FT = 0	38.20	60.94	46.32	43.80	44.25	32.14	33.83	24.11
With "caries experience" D <sub>3</sub> MFT > 0	63.72	39.06	54.41	56.93	56.64	72.32	69.14	78.76
With "current decay" D <sub>3</sub> T > 0	39.10	18.23	33.09	32.12	35.40	49.11	40.15	52.51
% children with 1 or more sealant/sealant restoration <sup>1</sup>	50.55	59.90	58.82	53.28	62.83	43.75	43.12	44.87
Care Index <sup>2</sup>	45.81	62.20	47.10	55.93	52.25	44.86	46.15	39.18
Treatment Index <sup>3</sup>	56.16	62.83	52.43	62.71	60.67	54.32	59.62	51.20
Restoration Index <sup>4</sup>	52.39	62.59	50.28	60.54	58.00	50.36	54.80	46.26

<sup>1</sup>Teeth with N or \$, otherwise "sound"  
<sup>2</sup>[(FTx100)/(DMFT)]  
<sup>3</sup>[(MT+FT)x100/(DMFT)]  
<sup>4</sup>[FTx100/(DT+FT-C<sub>3</sub>T)]

**FIGURE 1**

Mean number of decayed, missing and filled teeth (D<sub>3</sub>MFT) per child, for each deprivation category (DEPCAT).

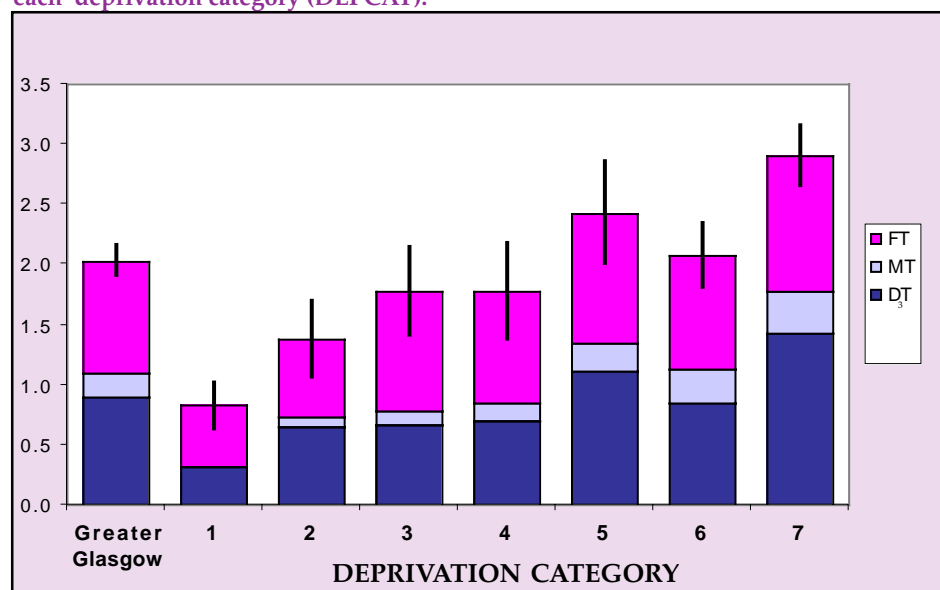


Figure 1 shows the mean D<sub>3</sub>MFT values for each DEPCAT score or grouping and the confidence intervals associated with each mean value. The size of the vertical error bars determines the very limited extent to which the figure can be interpreted as a simple "league table". Differences in the means which fall within the limits of respective error bars are not significant.

**TABLE 3**

Mean number of surfaces decayed (D<sub>3</sub>S), missing (MS), filled (FS), sealed (SS) and with sealant restorations (NS), per child for each deprivation category. [decay defined as decay into dentine].

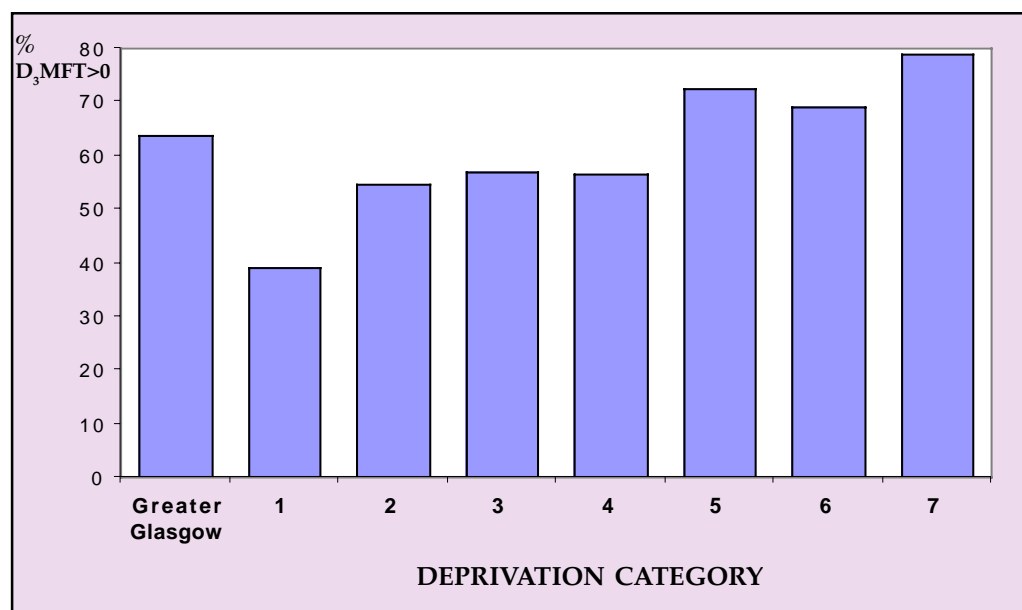
	D <sub>3</sub> S	MS*	FS**	D <sub>3</sub> FS	SS	NS
DEPCAT 1	0.45	0.03	0.96	1.41	1.71	0.01
DEPCAT 2	1.18	0.37	0.98	2.16	1.58	0.05
DEPCAT 3	0.91	0.62	1.61	2.53	1.63	0.07
DEPCAT 4	1.08	0.75	1.93	3.01	2.31	0.06
DEPCAT 5	1.81	1.16	1.98	3.79	0.96	0.03
DEPCAT 6	1.56	1.41	1.67	3.23	1.20	0.03
DEPCAT 7	2.83	1.74	2.13	4.96	1.13	0.04
<b>Greater Glasgow</b>	<b>1.63</b>	<b>1.03</b>	<b>1.67</b>	<b>3.30</b>	<b>1.42</b>	<b>0.04</b>

\*4 surfaces are counted for a missing anterior and 5 for a posterior tooth  
 \*\*Filled surfaces include codes F (filled, no decay), N (obvious sealant restoration) and R (filled, needs replacing)

Table 3 gives the number of decayed, missing, filled and sealed surfaces and the number of surfaces with sealant restorations by deprivation category or grouping.

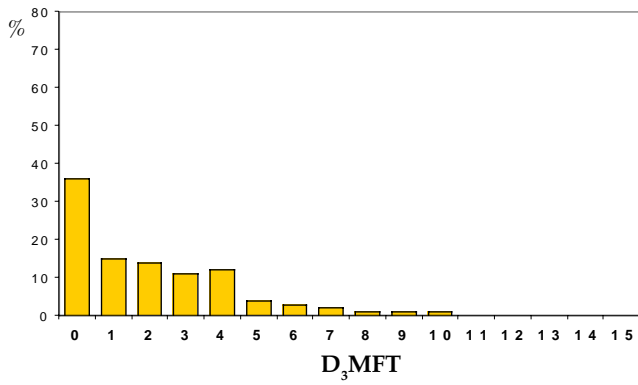
**FIGURE 2**

Proportion of children with caries experience (D<sub>3</sub>MFT>0) for each deprivation category (DEPCAT).

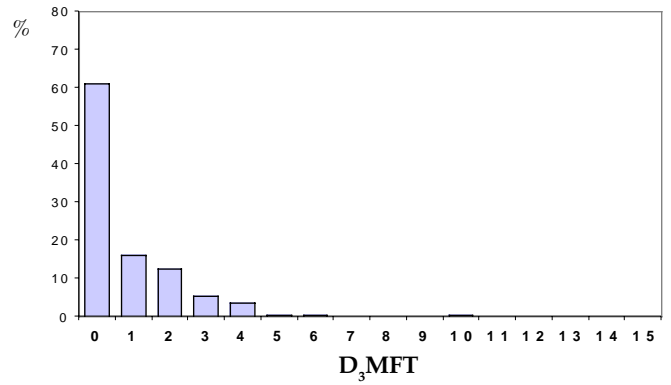


The clear link between postcode-related measures of social deprivation and caries in children has previously been established (Sweeney et al, 1997). Figure 2 illustrates the difference between 12 year old children who live in the most deprived areas, DEPCAT 7, and their more fortunate contemporaries residing in DEPCAT 1. There was marked variation between these areas with twice as many children in DEPCAT 7 having already experienced dental decay (i.e. decay, fillings or extractions as a result of decay) compared to those in DEPCAT 1. Overall, 64% of Greater Glasgow children in this age group fall into this category.

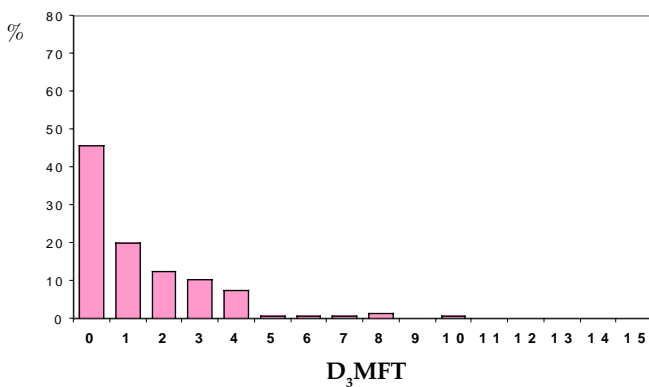
**FIGURE 3**  
**D<sub>3</sub>MFT frequency distribution for Greater Glasgow.**



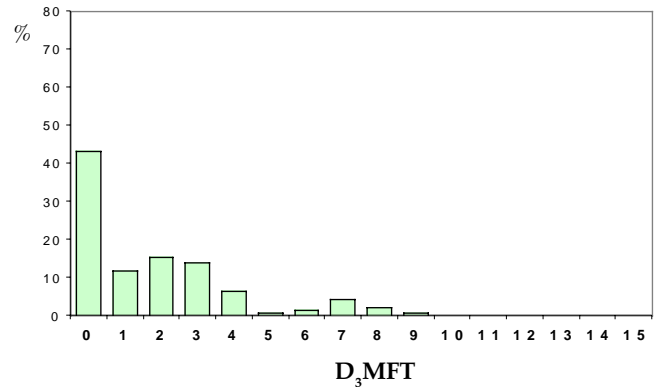
**FIGURE 3i.**  
**D<sub>3</sub>MFT frequency distribution for DEPCAT 1.**



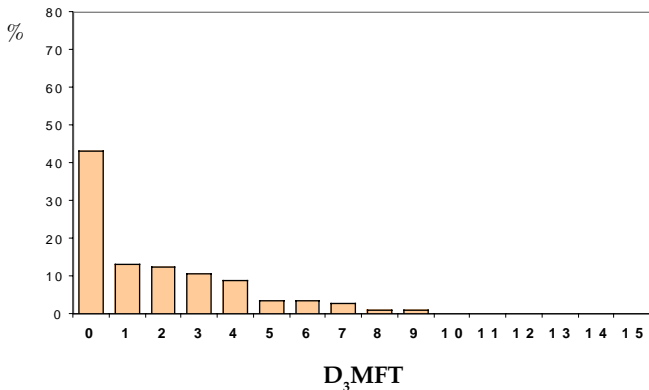
**FIGURE 3ii.**  
**D<sub>3</sub>MFT frequency distribution for DEPCAT 2.**



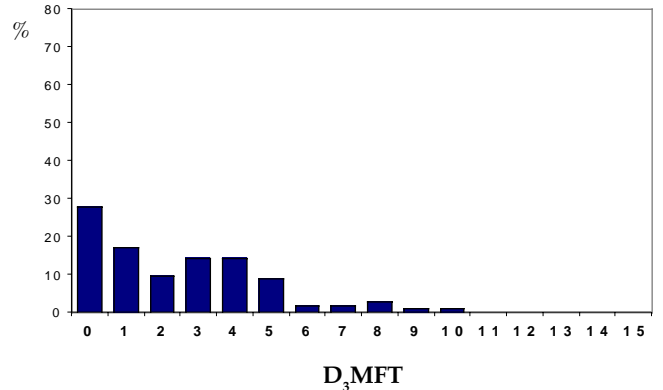
**FIGURE 3iii.**  
**D<sub>3</sub>MFT frequency distribution for DEPCAT 3.**



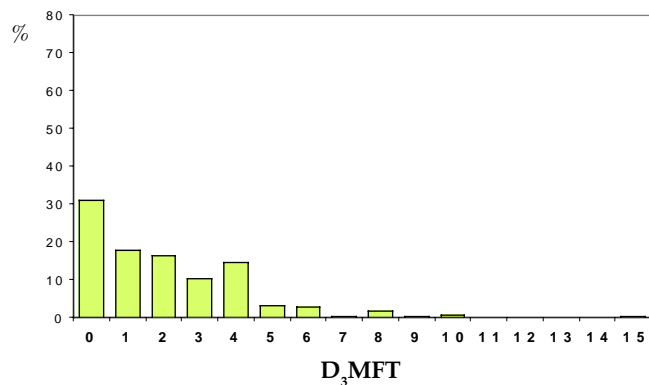
**FIGURE 3iv.**  
**D<sub>3</sub>MFT frequency distribution for DEPCAT 4.**



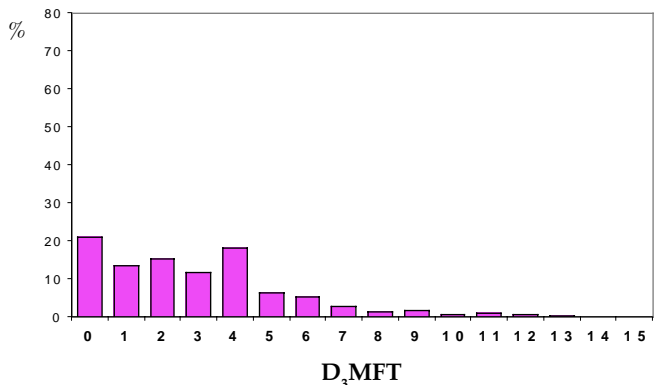
**FIGURE 3v.**  
**D<sub>3</sub>MFT frequency distribution for DEPCAT 5.**



**FIGURE 3vi.**  
**D<sub>3</sub>MFT frequency distribution for DEPCAT 6.**



**FIGURE 3vii.**  
**D<sub>3</sub>MFT frequency distribution for DEPCAT 7.**



**TABLE 4**

Percentage of children with demarcated opacities, diffuse opacities and hypoplasias on upper incisors, by deprivation category (tooth data and scores for all 4 incisors counted).

	Demarcated Opacities %	Diffuse Opacities %	% children with diffuse opacities who had Impact score=1 Symmetrical opacities		Hypoplasias %	Valid cases
DEPCAT 1	13.2	11.1	19.0	81.0	2.1	189
DEPCAT 2	17.7	13.8	16.7	55.6	0.8	130
DEPCAT 3	9.8	15.0	10.0	57.9	1.5	133
DEPCAT 4	13.5	9.6	0	70.0	1.0	104
DEPCAT 5	12.6	10.8	8.3	25.0	0.9	111
DEPCAT 6	14.3	8.7	0	78.3	0.8	265
DEPCAT 7	10.5	10.3	11.6	74.4	1.2	418
<b>Greater Glasgow</b>	<b>12.6</b>	<b>11.3</b>	<b>10.0</b>	<b>69.8</b>	<b>1.1</b>	<b>1420</b>

\*valid cases

Developmental defects of enamel were assessed using the SCOTS modification of the Developmental Defects of Enamel Index (SCOTS2). Also included were two questions relating to the children's self-perception of any marks on their teeth. **Table 4** shows the frequencies of the three types of anomalies in each deprivation category, demonstrating the minor differences reported between deprivation categories. The overall value for demarcated opacities for Greater Glasgow of 12.6% remains very similar to the figure of 11.8% recorded in the last survey.

The frequencies of SCOTS2 classification, by deprivation category are presented in **Table 5**. There has been a rise since 1996/97 in the overall percentage of children in Greater Glasgow free of developmental defects of enamel from 68.8% to 77.8%, the prevalence of demarcated opacities has remained roughly similar and the prevalence of diffuse opacities has dropped from 15.2% to 9.9%. It is important to note that any variation in values between surveys may relate, in part, to examiner variability and that Tables 4 to 5 offer only a broad indication of the levels of developmental defects of enamel in these children.

**TABLE 5**

Frequencies of SCOTS2 classifications by deprivation category (each individual is scored for the highest single value excluding those teeth missing or unscorable).

SCOTS2/DDE Index	% Normal 0	% Demarcated 1	% Diffuse 2	% Hypoplasia 3	% Combination of defects 4-7	% with SCOTS2 code 1-7 who were aware of marks on their teeth*	Valid cases
DEPCAT 1	77.2	10.1	8.5	1.6	2.6	32.6	189
DEPCAT 2	70.8	14.6	13.1	0.8	0.8	42.1	130
DEPCAT 3	75.9	7.5	12.8	1.5	2.3	35.5	133
DEPCAT 4	76.9	12.5	9.6	0	1.0	33.3	104
DEPCAT 5	79.3	9.9	9.9	0	0.9	56.5	111
DEPCAT 6	78.9	12.1	7.5	0.4	1.1	35.7	265
DEPCAT 7	80.6	8.6	9.1	0.5	1.2	35.0	418
<b>Greater Glasgow</b>	<b>77.8</b>	<b>10.2</b>	<b>9.9</b>	<b>0.6</b>	<b>1.5</b>	<b>36.7</b>	<b>1420</b>

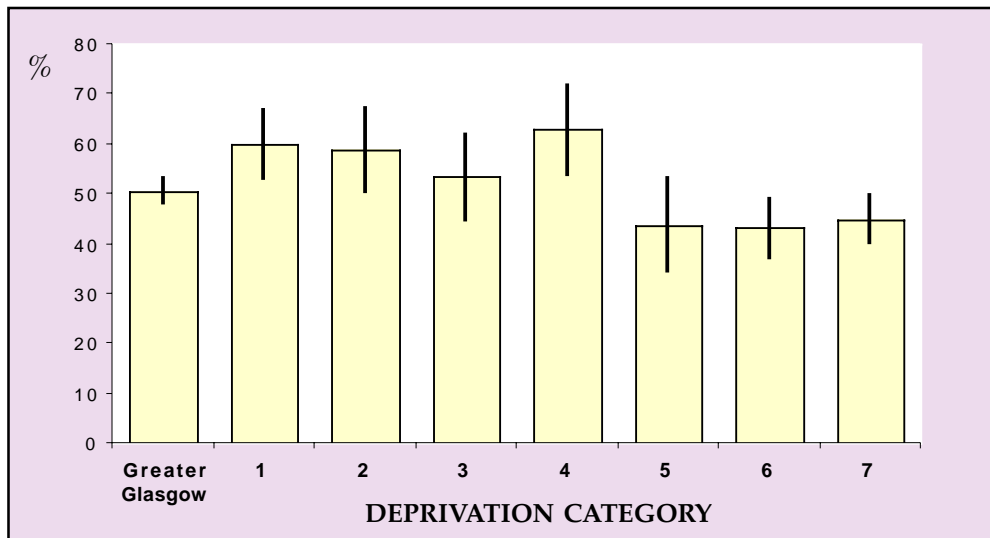
\*based on those from whom an answer was available

Oral cleanliness was assessed by recording the presence of plaque on six index teeth (UR6, UR1, UL6, LR6, LL1, LL6). The results, by deprivation category or grouping, for the oral cleanliness assessment are given in **Table 6**.

**TABLE 6**  
Mean plaque scores and distribution of total plaque scores for each deprivation category.

	Mean	s.d.	Some teeth assessed for plaque	% of children with each total plaque score*							6 teeth assessed for plaque
				0	1	2	3	4	5	6	
DEPCAT 1	0.27	0.26	192	33	21	18	17	7	3	2	187
DEPCAT 2	0.39	0.31	136	14	28	25	6	14	6	6	125
DEPCAT 3	0.28	0.30	137	36	18	21	11	6	7	2	125
DEPCAT 4	0.29	0.30	113	33	25	11	13	8	10	1	92
DEPCAT 5	0.38	0.32	112	21	22	11	19	14	7	6	95
DEPCAT 6	0.32	0.32	269	35	19	15	13	7	5	5	216
DEPCAT 7	0.39	0.33	419	25	20	18	10	13	8	6	335
<b>Greater Glasgow</b>	<b>0.34</b>	<b>0.31</b>	<b>1450</b>	<b>28</b>	<b>21</b>	<b>18</b>	<b>13</b>	<b>10</b>	<b>6</b>	<b>4</b>	<b>1239</b>

**FIGURE 4**  
Proportion of children with one or more sealant/sealant restoration in each deprivation category (DEPCAT).



**Figure 4** shows the proportion of 12 year old children in each deprivation category or grouping with one or more sealant or sealant restoration in the permanent dentition. Overall, the proportion of children with one or more sealant/sealant restoration in Greater Glasgow has remained broadly similar to the figure of 50% in the last survey in 1996/97. However it can be seen that more children from prosperous areas benefited from this proven preventive measure than their peers living in areas with DEPCAT scores 5, 6 and 7. (Note should be taken of the size of the vertical error bars as differences in the means which fall within the limits of respective error bars are not significant).

The SIGN (Scottish Intercollegiate Guidelines Network) guideline on targeted caries prevention for 6 -16 year olds has reviewed the literature and scientific evidence supporting the use of fissure sealants. It has found them to be an effective caries preventive measure when applied according to a protocol (Murray & Nunn, 1993) and maintained over time (Deery et al, 1997).

The training and calibration courses for this fourth survey of 12 year old children were held in Perth, a good central location accessible to the examining teams from all over Scotland who take part.

Perth Grammar School (Rector, Mr D Bader) kindly agreed to allow the training and calibration courses to take place on its premises. Without the cooperation of the children, their parents and the staff at the school, these courses which ensure the integrity of these epidemiological surveys, would not have been possible. The Scottish Health Boards' Dental Epidemiological Programme is grateful to them all.

Greater Glasgow Health Board would also like to extend its sincere thanks to all the children who participated in the Survey. The data gathered is of great importance both locally and nationally and helps in the planning of action to improve our children's dental health.

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**This report contains the results of a single health board survey which require local interpretation.**

The Greater Glasgow Report is also available at <http://www.dundee.ac.uk/dhsru/>

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