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The Child Dental Health Survey, Victoria 2000

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Abbreviations

d	deciduous decayed teeth
m	deciduous missing teeth
f	deciduous filled teeth
dmft	deciduous decayed, missing and filled teeth
D	permanent decayed teeth
M	permanent missing teeth
F	permanent filled teeth
DMFT	permanent decayed, missing and filled teeth
SD	standard deviation

Purpose of this report

This report continues the series of annual reports providing descriptive statistics concerning child dental health in Victoria and follows the 1999 report. Information listed in the tables includes: the age and sex of children in the sample, their deciduous and permanent caries experience, frequency of fissure sealants, history of school dental service examinations and caries experience by geographical region, sex, card-holder status and country of birth.

The report also provides simple, summary statements highlighting differences between the 1999 and 2000 results. However, no formal hypothesis tests have been undertaken and descriptions of differences between years are intended as a guide to the reader rather than as an evaluation of trends.

Sources of subjects and sampling

Data were collected during the 2000 calendar year on Victorian School Dental Service patients by dental therapists and dentists. Children were sampled on the first day of each month during 2000 and were included if their birth dates fell between the 1st and the 4th day of the month. Approximately 4.5% of sampled children had birth dates falling outside of this range and these children were left in the data set.

Data were weighted for all analyses to more accurately reflect the distribution of child population in Victoria. A map showing the geographical regions of Victoria is presented in Figure 1. The regions included five from rural areas (Barwon South Western, Grampians, Loddon Mallee, Hume and Gippsland) and four from metropolitan Melbourne and surrounds (Western Metropolitan, Northern Metropolitan, Eastern Metropolitan and Southern Metropolitan).

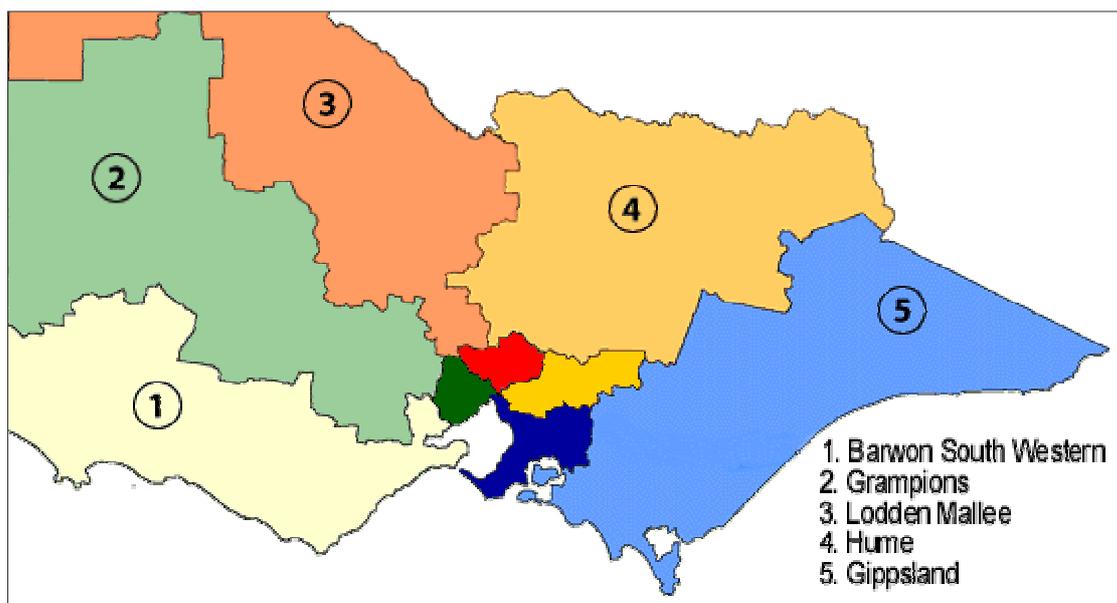


Figure 1: Victoria by geographical region of sampling

Children from the Barwon South Western, Eastern Metropolitan and Southern Metropolitan regions were initially under-represented in the sampling and were weighted up in the analysis whereas children from the Grampians, Loddon Mallee, Hume, Gippsland, Western Metropolitan and Northern Metropolitan regions were over-represented relative to actual population distribution and were weighted down in the analyses (see Table 1).

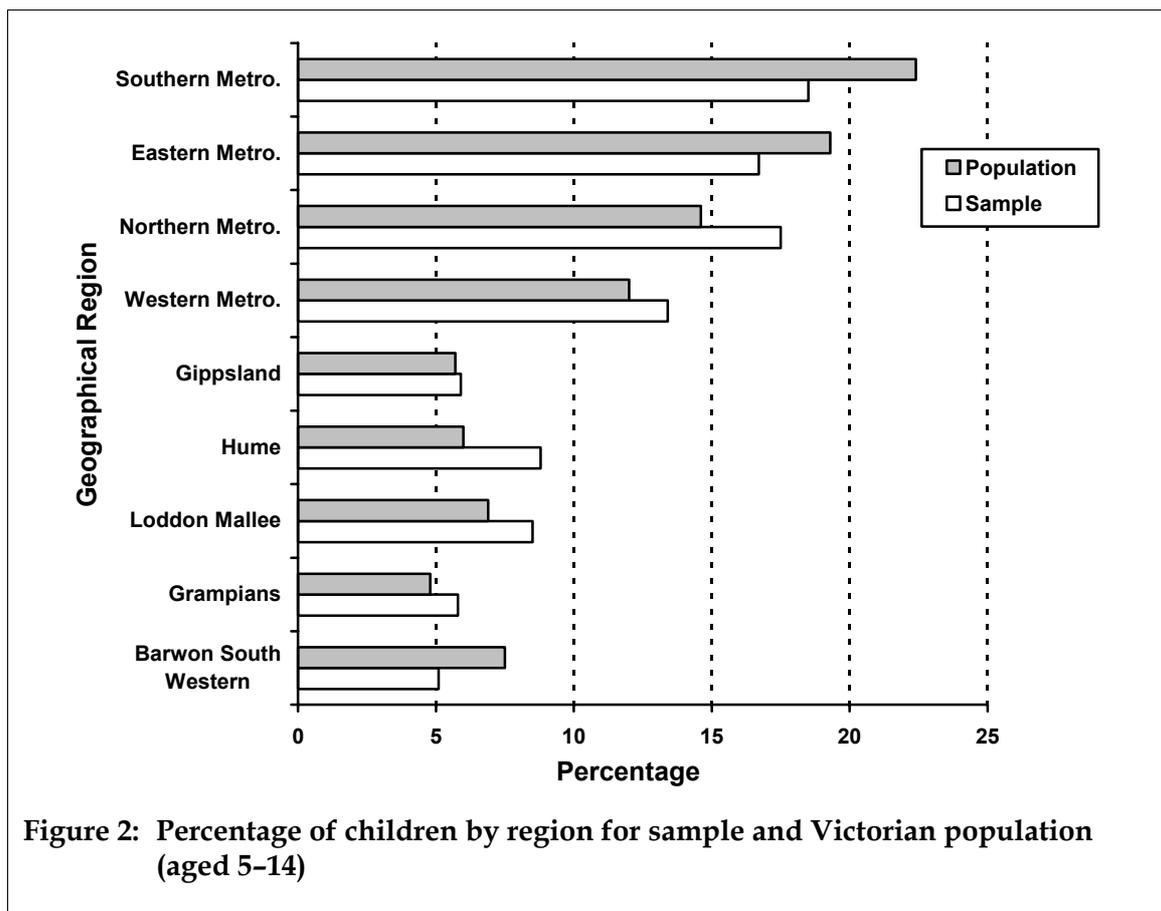
Weighting was carried out so that the regional contributions for the study equaled the distribution of children aged 5–14 years in Victoria as provided by the Australian Bureau of Statistics as at 30 June 2000. A comparison of the percentage of children across regions for both the current sample and for the Victorian population is given in Figure 2. One of the repercussions of the weighting was to slightly increase the weights for children from Metropolitan Melbourne (average weight = 1.04) while decreasing the weights for children from rural areas (average weight = 0.90).

Data analysis

The data were cleaned prior to analysis to correct data entry errors and to eliminate any duplicate cases. Age-specific indices denoted with an asterisk (*) are those in which the relative standard error exceeds 40% and population estimates of these indices are considered to be statistically unreliable and should be interpreted with due care.

Table 1: Sample size and assigned weight by region

Region	Number Sampled	Weight
Barwon South Western	463	1.46
Grampians	521	0.83
Loddon Mallee	769	0.81
Hume	798	0.68
Gippsland	530	0.97
Western Metropolitan	1,209	0.90
Northern Metropolitan	1,581	0.83
Eastern Metropolitan	1,512	1.16
Southern Metropolitan	1,672	1.27



Demographic composition of the sample

A total of 8,707 children aged 4 to 17 years were sampled in 2000 (see Table 2). The frequency distribution of children's ages peaked for children aged 6 and 7 years, and few children aged less than 5, or more than 13 years, were sampled. Accordingly, it is important to note that the sample was greatest for primary school aged children and that caution should be used when considering the representativeness of the sample for older children.

Due to the very small number of children aged 15 and older ($n = 25$) results for these age groups have been suppressed in the results to follow.

Changes since 1999

The total number of children sampled in 2000 was 1,805 fewer than in 1999, reversing the increase of 1,899 children sampled between 1998 and 1999. There were decreases in the number of children sampled across all age categories.

Table 2: Demographic composition of the sample

Age (years)	Children in sample				Children in sample (weighted)			
	Males	Females	Unknown	Persons	Males	Females	Unknown	Persons
	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>
4	25	17	0	42	25	18	0	42
5	469	428	2	899	468	430	2	899
6	674	614	37	1,325	682	619	37	1,338
7	668	611	38	1,317	666	620	37	1,323
8	628	576	45	1,249	625	573	43	1,241
9	571	561	48	1,180	577	562	47	1,186
10	499	502	63	1,064	496	508	62	1,065
11	452	415	34	901	458	413	34	906
12	185	177	43	405	186	172	43	400
13	88	99	30	217	81	94	28	203
14	33	30	19	82	32	30	16	78
15	5	6	8	19	5	5	8	18
16	3	1	1	5	2	1	1	5
17	1	1	0	2	1	1	0	2
Total	4,301	4,038	368	8,707	4,303	4,045	358	8,707

Deciduous teeth

As can be seen in Table 3, the mean number of clinically detectable decayed teeth was highest for 6-year-olds and declined steadily to 0.27 for children aged 12 years. In contrast, the mean number of filled deciduous teeth increased to 1.07 for 9-year-old children before declining, again as a result of the exfoliation of deciduous teeth. The variation in mean dmft across the age range showed a similar pattern to that of the filled component, increasing from 1.62 for 4-year-olds to 2.25 for 8-year-old children before declining to 0.69 for 12-year-olds.

The percentage of caries experience accounted for by clinically detectable decay (d/dmft) showed an age-associated decline, almost halving from 78.6% among 5-year-olds to just over 40% for children aged between 10 and 12 (see Table 4). The percentage of children with no recorded caries experience in the deciduous dentition (% dmft = 0) reduced from 58.1% among 5-year-olds to a low of 43.1% among 9-year-olds before rising again due to the exfoliation of deciduous teeth.

Table 3: Deciduous dentition - decayed, missing and filled teeth by age

Age	Children	Decayed (d)		Missing (m)		Filled (f)		dmft	
		<i>n</i>	mean	SD	mean	SD	mean	SD	mean
4	42	1.28	2.02	0.02*	0.14*	0.33	0.71	1.62	2.40
5	899	1.32	2.53	0.08	0.53	0.39	1.23	1.80	3.20
6	1,338	1.36	2.20	0.13	0.78	0.52	1.33	2.00	2.96
7	1,323	1.09	1.97	0.17	0.83	0.77	1.59	2.03	2.96
8	1,241	1.02	1.70	0.21	0.82	1.01	1.73	2.25	2.98
9	1,186	0.85	1.33	0.13	0.52	1.07	1.72	2.05	2.54
10	1,065	0.68	1.27	0.12	0.49	0.92	1.54	1.72	2.40
11	906	0.39	0.91	0.07	0.38	0.54	1.24	1.00	1.86
12	400	0.27	0.73	0.06	0.36	0.36	0.98	0.69	1.54

* relative standard error \geq 40%

Table 4: Deciduous dentition - caries experience indices by age

Age	d/dmft		dmft = 0	
	<i>n</i>	%	<i>n</i>	%
4	20	75.7	42	52.3
5	376	78.6	899	58.1
6	656	72.9	1,338	51.0
7	651	56.8	1,323	50.8
8	683	49.7	1,241	44.9
9	674	46.2	1,186	43.1
10	537	42.4	1,065	49.6
11	316	44.1	906	65.1
12	99	43.2	400	75.3

Changes since 1999

Looking only at children between the ages of 5 and 10, there was a 10.8% decrease in the mean number of clinically detectable decayed teeth between 1999 and 2000 for children aged 5, while a 7.9% increase occurred for children aged 10 years old. Increases in the mean number of filled teeth ranged between 13% and 37% for children aged between 5 and 7. The largest changes in mean dmft between 1999 and 2000 were for 5-year-olds (a decrease of 5.3%) and for 7- and 10-year-olds (Increases of 8.6% and 4.9%) respectively. Changes in the d/dmft ratio were few and relatively small, with increases for children aged 4, 5 and 7. The average percentage of children with dmft = 0 also varied little between 1999 and 2000, with small increases for children aged 5 and 11.

Permanent teeth

The mean number of clinically decayed permanent teeth generally increased across the age groups (see Table 5). A similar pattern is apparent for filled teeth although at every age children presented with more clinically decayed teeth than filled teeth. The mean DMFT also rose quite consistently across age groups, increasing from 0.06 for 5-year-olds to 1.84 for 14-year-olds. The DMFT for 12-year-old children in 2000 was 1.07.

The percentage of DMFT due to decay (D/DMFT) and the percentage caries free (DMFT = 0) declined steadily across age groups (see Table 6). At age 12, 57.7% of children had no clinically detectable indication of decay in their permanent dentition.

Table 5: Permanent dentition – decayed, missing and filled teeth by age

Age	Children <i>n</i>	Decayed (D)		Missing (M)		Filled (F)		DMFT	
		mean	SD	mean	SD	mean	SD	mean	SD
5	899	0.05	0.35	0.00	0.00	0.01*	0.09*	0.06	0.40
6	1,338	0.09	0.45	0.00	0.05*	0.02	0.22	0.11	0.56
7	1,323	0.24	0.72	0.00	0.03*	0.04	0.28	0.28	0.81
8	1,241	0.31	0.73	0.01*	0.10*	0.09	0.40	0.40	0.90
9	1,186	0.31	0.74	0.00	0.08*	0.17	0.58	0.49	0.95
10	1,065	0.33	0.76	0.02	0.15	0.22	0.67	0.57	1.07
11	906	0.41	0.85	0.04	0.36	0.35	0.85	0.80	1.31
12	400	0.55	1.13	0.06	0.38	0.47	0.97	1.07	1.75
13	203	0.65	1.26	0.07*	0.43*	0.59	1.21	1.30	2.13
14	78	0.91	1.69	0.18*	0.72*	0.74	1.13	1.84	2.30

* relative standard error \geq 40%

Table 6: Permanent dentition – caries experience indices by age

Age	D/DMFT		DMFT = 0	
	<i>n</i>	%	<i>n</i>	%
5	24	93.7	899	97.3
6	82	88.5	1,338	93.9
7	199	89.9	1,323	84.9
8	287	79.4	1,241	76.9
9	328	65.4	1,186	72.3
10	314	61.2	1,065	70.5
11	355	52.3	906	60.8
12	170	52.0	400	57.7
13	87	52.1	203	57.2
14	46	49.0	78	40.5

Changes since 1999

There were a number of decreases in permanent caries experience between 1999 and 2000. Between the ages of 6 and 13 inclusive, clinically detectable decay decreased for all age groups, with reductions for 6–12-year-olds of up to 35.7%. However, the mean number of filled teeth remained relatively stable between 1999 and 2000, although children aged 10 and 13 experienced a decrease of 18.5% and 7.8% respectively while children aged 11 and 12 had an increase of 9.3% and 14.6% respectively. As a result of the decreases in mean decay, mean DMFT scores were lower for most age groups and the percentage of the DMFT score accounted for by the decayed component also reduced for most age groups. Between 1999 and 2000 the percentage of children with a DMFT score of zero increased for children aged 6, 7, and between 9 and 13 years of age.

All teeth

Untreated caries in the combined deciduous and permanent dentitions (see Table 7) existed for between 35.0% and 48.6% of children in any age group from 4 to 14 years. Within this range, the greatest likelihood of untreated decay occurred for 8-year-olds where only 51.4% of children had d+D of zero. More extensive levels of untreated decay (5 or more decayed deciduous or permanent teeth) generally declined across ages, ranging from 10.5% of 6-year-olds to 2.4% of 11- and 12-year-olds. This age trend indicates that the greatest contribution to high levels of clinically detectable caries came from the deciduous dentition.

Table 7: All teeth – age-specific caries experience

Age	Children <i>n</i>	d+D =						m+M = 0	f+F = 0	dmft+ DMFT = 0
		0	1	2	3	4	5+			
		%	%	%	%	%	%	%	%	%
4	42	57.0	21.1	0.0	1.6*	8.7*	11.7*	98.1	78.0	52.3
5	899	60.6	11.7	8.4	5.1	4.7	9.5	95.9	86.2	57.0
6	1338	55.7	11.8	10.3	6.4	5.3	10.5	94.8	80.2	49.0
7	1323	55.9	14.9	10.2	5.0	5.0	9.0	92.7	72.4	46.4
8	1241	51.4	16.6	12.7	7.2	4.2	7.9	89.3	62.5	39.0
9	1186	51.8	16.8	14.2	8.0	4.3	4.9	91.5	56.4	35.4
10	1065	56.6	17.9	10.5	7.2	3.2	4.6	91.8	57.6	39.3
11	906	60.5	19.2	10.0	5.7	2.3	2.4	93.6	64.6	41.5
12	400	62.3	16.2	10.3	6.2	2.6	2.4	93.8	63.4	45.7
13	203	65.0	12.8	10.0	5.4	5.0	1.9*	94.9	68.2	49.9
14	78	55.4	25.9	7.7	1.5*	3.5*	5.9*	90.2	59.6	37.0

* relative standard error \geq 40%

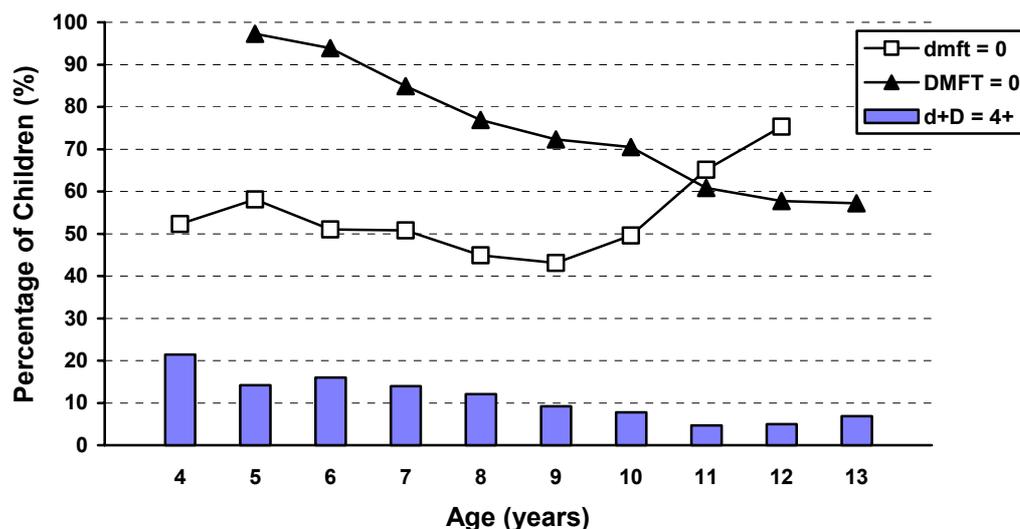


Figure 3: Percentage of children with dmft = 0, DMFT = 0 and d+D = 4+

While 89% or more of children had no deciduous or permanent teeth missing due to caries in any age group, smaller percentages avoided fillings and this was clearly associated with age. Although 86.2% of 5-year-olds had no fillings, this declined to 56.4% for 9-year-olds before increasing again to 68.2% for 13-year-old children. Similarly, the percentage of children with no caries experience (dmft+DMFT = 0) was age associated, reducing to 35.4% for 9-year-old children before increasing to 49.9% for children aged 13.

Figure 3 shows the percentages of children with dmft = 0, DMFT = 0 and d+D ≥ 4.

Changes since 1999

Children in most age groups had less caries experience in 2000 than in 1999 with increases in the percentage d+D = 0 for seven age groups across these years. This finding was reflected in statistics for dmft+DMFT = 0 which also increased for 7 age groups between 1999 and 2000 despite declines for a number of age groups in the percentages of children with f+F = 0.

Fissure sealants

The use of fissure sealants increased sharply for children across the age range of 6 to 11 (see Table 8), rising from a mean of 0.10 to a mean of 1.52, with more modest increases across the older age groups. There was generally a higher frequency of fissure sealants among children with permanent caries experience (DMFT ≥ 1) than for those with no caries experience (DMFT = 0), although there was little difference for 10- and 11-year-olds.

Table 8: Fissure sealants – age-specific experience

Age	Children	Sealants		Students with sealants			
				DMFT = 0		DMFT ≥ 1	
	<i>n</i>	mean	SD	<i>n</i>	%	<i>n</i>	%
6	1,338	0.10	0.54	1257	3.1	82	12.3
7	1,323	0.37	1.05	1124	10.9	199	22.3
8	1,241	0.76	1.44	954	23.2	287	30.8
9	1,186	1.16	1.62	858	36.0	328	45.7
10	1,065	1.42	1.69	751	46.6	314	49.2
11	906	1.52	1.74	551	50.6	355	51.6
12	400	1.52	1.77	231	46.4	170	61.0
13	203	1.63	2.15	116	41.9	87	53.6
14	78	1.85	1.95	32	47.0	46	68.8

Changes since 1999

There were increases in the mean number of fissure sealants between 1999 and 2000 for children aged between 6 and 11, while decreases were recorded for children aged 12 years and over. These changes were reflected in an increase in the mean number of fissure sealants for those children with clinical caries experience (DMFT ≥ 1) and those children without (DMFT = 0).

School Dental Service examinations

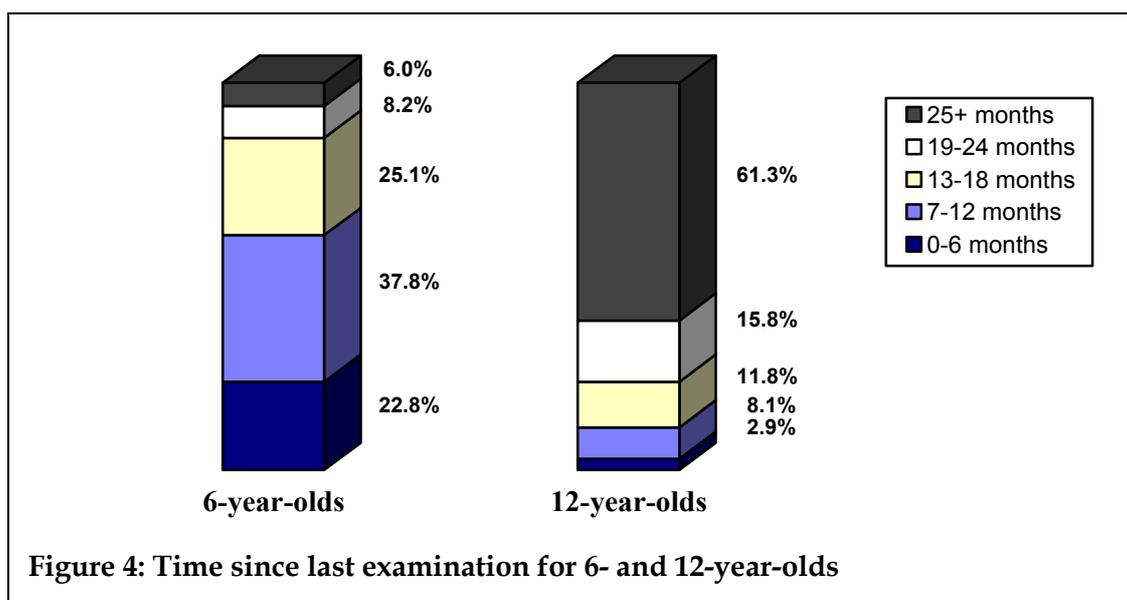
Due to the limited information available regarding those children who were not positively identified as having had a previous examination within the School Dental Service, the breakdown of children with previous, no previous, and unknown examination histories is not presented here. Table 9 therefore refers only to children with known previous examinations and indicates their distribution according to time since last dental examination. All 5-year-old children had had an examination within the previous 12 months. However, fewer than 13% of children aged between 8 and 12 years of age had had a previous examination within the preceding 12 months. The most common time period since a previous examination for older children was greater than 2 years. Substantial percentages of children aged 7 years or more had also had their previous examination between 18 months and 24 months previously. For 12-year-old children who had previously had an examination, 38.7% had had an examination within the previous 2 years.

The mean time since last examination increased from 11.12 months for 6-year-old children to 25.59 months for children aged 11 years old. The dramatic change across age groups in the time since last exam can be seen graphically in Figure 4. For 6-year-olds, 85.7% had their last exam 0–18 months previously whereas only 22.8% of 12-year-olds had their last exam 0–18 months previously.

Table 9: School Dental Service examinations – time since last visit

Age	Children <i>n</i>	Months since last visit					mean	SD
		0–6	7–12	13–18	19–24	25+		
		%	%	%	%	%		
4	1	0.0	0.0	100.0	0.0	0.0	14.96*	–
5	8	68.8	31.2*	0.0	0.0	0.0	4.87*	3.88*
6	91	22.8	37.8	25.1	8.2	6.0*	11.12	6.34
7	322	7.4	14.6	16.3	29.4	32.3	19.19	7.91
8	521	2.9	9.5	11.4	21.5	54.7	23.66	8.38
9	543	2.9	8.3	9.7	23.4	55.7	24.24	8.56
10	491	2.8	7.8	12.8	21.2	55.4	24.28	8.56
11	429	1.9	7.4	9.5	16.9	64.4	25.59	8.41
12	218	2.9	8.1	11.8	15.8	61.3	25.53	9.59
13	88	4.1*	17.8	7.9	16.9	53.3	23.73	10.78
14	42	2.0*	6.1*	22.5	14.5	55.0	24.39	9.17*

* relative standard error $\geq 40\%$



Changes since 1999

Of those children with previous examinations, there were smaller numbers of children represented in most age groups in 2000 compared to 1999. There was a decrease for children aged between 6 and 11 in the mean number of months since last visit while an increase was observed for children aged 12 years and older.

Caries experience by region

Caries experience in the deciduous dentition varied markedly by region (see Table 10). Clinically detectable caries was lowest in the four metropolitan regions and highest in the Grampians and Loddon Mallee regions (means = 2.50 and 2.23 respectively). A similar pattern to that shown with decay can also be seen in respect to deciduous missing and filled teeth, with rural regions showing higher mean scores than metropolitan regions, Loddon Mallee the highest of any region and Eastern Metropolitan the lowest. Mean dmft scores ranged from 1.49 in the Eastern Metropolitan region to 3.45 in the Grampians region.

A similar pattern to that shown in the deciduous dentition can be seen in the permanent caries experience of 11–12-year-olds (Table 11). Again, rural regions show generally higher caries experience scores than are shown in metropolitan regions, although the differences are not as great as in the deciduous dentition and there is some overlap. The highest mean DMFT score was for Hume (mean = 1.38) with the lowest mean score in the Eastern Metropolitan region (mean = 0.55).

Table 10: Five–six-year-old deciduous caries experience by region

Region	n	Decayed teeth		Missing teeth		Filled teeth		dmft	
		mean	SD	mean	SD	mean	SD	mean	SD
Barwon South Western	107	1.50	2.15	0.13	0.72	0.66	1.53	2.30	2.99
Grampians	92	2.50	2.82	0.18	0.63	0.76	1.56	3.45	3.37
Loddon Mallee	202	2.23	3.40	0.26	0.95	0.73	1.59	3.23	4.13
Hume	174	1.78	2.71	0.16	0.82	0.45	1.20	2.39	3.27
Gippsland	74	1.89	2.48	0.20	1.05	0.76	1.60	2.85	3.58
Western Metropolitan	300	1.22	2.05	0.13	0.83	0.36	1.09	1.70	2.65
Northern Metropolitan	422	1.13	2.10	0.10	0.76	0.36	1.20	1.59	2.79
Eastern Metropolitan	384	1.06	2.20	0.03	0.20	0.40	1.17	1.49	2.76
Southern Metropolitan	469	1.15	2.10	0.10	0.54	0.43	1.27	1.67	2.94

Table 11: Eleven-twelve-year-old permanent caries experience by region

Region	Decayed teeth			Missing teeth		Filled teeth		DMFT	
	<i>n</i>	mean	SD	mean	SD	mean	SD	mean	SD
Barwon South Western	84	0.49	1.15	0.00	0.00	0.46	1.19	0.95	1.70
Grampians	65	0.55	1.24	0.02	0.12	0.38	0.76	0.95	1.57
Lodden Mallee	126	0.70	1.22	0.04	0.37	0.48	0.97	1.22	1.74
Hume	117	0.60	1.11	0.04	0.38	0.74	1.15	1.38	1.74
Gippsland	96	0.45	0.88	0.06	0.35	0.48	1.01	0.99	1.59
Western Metropolitan	174	0.44	0.86	0.06	0.41	0.44	1.03	0.93	1.60
Northern Metropolitan	200	0.31	0.77	0.06	0.37	0.21	0.61	0.58	1.20
Eastern Metropolitan	228	0.27	0.63	0.04	0.40	0.24	0.67	0.55	0.99
Southern Metropolitan	216	0.54	1.00	0.06	0.43	0.39	0.82	1.00	1.46

Caries experience by sex, card-holder status and country of birth

Caries experience for 5- and 6-year-old children and 11- and 12-year-old children is presented by sex of the child, Indigenous status and the child's country of birth in Table 13. In the deciduous dentition, males had a dmft score 12.7% higher than females, while the opposite trend occurred in the permanent dentition with females having slightly higher caries experience (6.7% higher DMFT) than males in the corresponding age range of 11–12 years.

Children covered by a health care card or pensioner card had higher caries experience in both the deciduous and permanent dentitions than did children without cover. For 5- and 6-year-old children, children with a health care card had a mean dmft score 62.3% higher than non-card holders in the corresponding age group. This difference was not as pronounced in the permanent dentition, where 11–12-year-old children covered by a health care card had a mean DMFT score 18.5% higher than non-card holding children in this age group.

Considerable differences are evident in the caries experience of children born in different regions of the world. For 5–6-year-olds caries experience was lowest for children from Sub-Saharan Africa and Southern & Eastern Europe, with children born in Australia having the sixth lowest caries experience. The highest dmft and DMFT scores occurred for children born in New Zealand and Other Oceania, Southern and Eastern Europe, North Africa and Middle East, South-East Asia and North-East Asia. In the deciduous dentition, mean dmft of those children born in North Africa and Middle East (mean = 3.26) was approximately 1.7 times higher than that of children born in Australia (mean = 1.89). Among 11–12-year-olds the mean DMFT score of children born in Southern and Eastern Europe (mean = 1.17) was approximately 1.2 times higher than the caries experience of children born in Australia (mean = 0.94).

Table 12: 5–6-year-old dmft and 11–12-year-old DMFT by sex, card-holder status and country of birth

Age	5-6-year-old dmft			11-12-year-old DMFT		
	<i>n</i>	mean	SD	<i>n</i>	mean	SD
Sex						
Male	1,182	2.13	3.19	661	0.89	1.44
Female	1,092	1.89	3.03	626	0.95	1.55
Card Status						
Non Card Holder	1,025	1.54	2.65	520	0.81	1.36
Health Care Card	750	2.50	3.59	495	0.96	1.58
Pensioner Card	538	2.25	3.18	350	1.01	1.56
Country of Birth						
Australia	1,618	1.89	2.98	1013	0.94	1.52
New Zealand and Other Oceania	53	2.98	3.98	25	0.52	0.92
North-West Europe	109	1.84	2.77	64	0.69	1.18
Southern and Eastern Europe	86	1.45	2.57	69	1.17	2.05
North Africa and Middle East	84	3.26	4.10	49	0.90	1.34
South-East Asia	165	2.72	3.70	73	1.00	1.35
North-East Asia	50	1.78	2.93	16	0.06	0.25
Southern and Central Asia	63	2.25	3.69	19	0.95	1.39
Northern America	8	1.50	2.27	5	0.80	1.30
Other Americas	21	2.19	3.66	9	0.78	1.39
Sub-Saharan Africa	25	1.16	2.56	15	0.60	0.99
Not Known	31	2.35	3.66	8	0.63	0.52