



**Australian Institute of  
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# The Child Dental Health Survey, Victoria 2001

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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 2000 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 selected trends, highlighting differences between the years 1997 and 2001. 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 a formal statistical evaluation.

## Sources of subjects and sampling

Data were collected during the 2001 calendar year on Victorian School Dental Service patients by dental therapists and dentists. Children were sampled on the first day of each month during 2001 and were included if their birth dates fell between the 1<sup>st</sup> and the 4<sup>th</sup> day of the month. A small percentage 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).

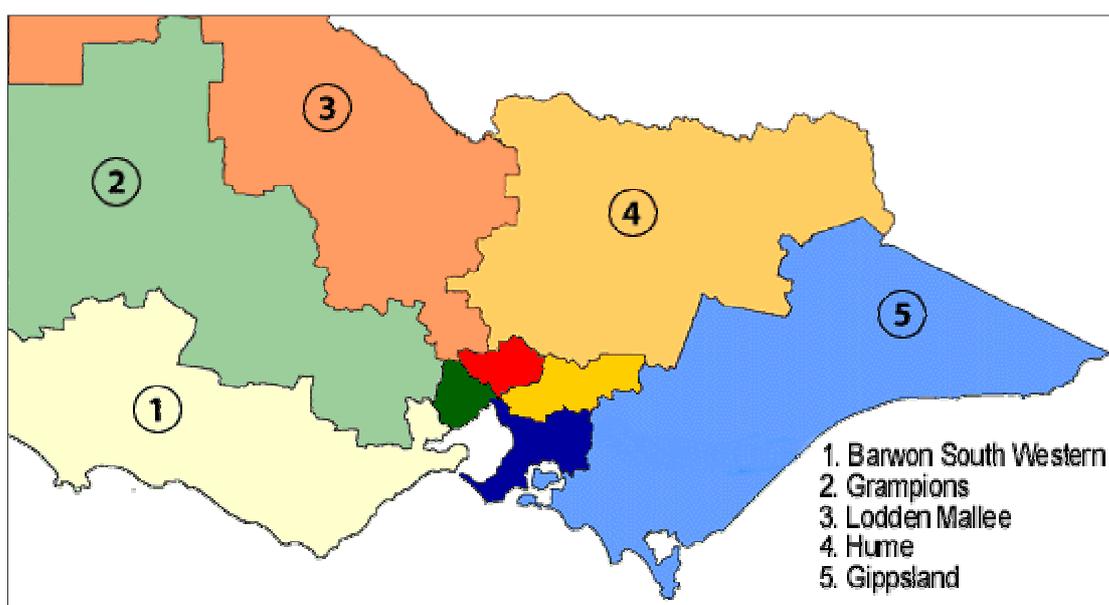


Figure 1: Victoria by geographical region of sampling

Children from the Barwon South Western, Grampians, Eastern Metropolitan and Southern Metropolitan regions were initially under-represented in the sampling and were weighted up in the analysis whereas children from the 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 2001. A comparison of the percentage of children across regions for both the current sample and for the Victorian population is given in Figure 2.

## 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.

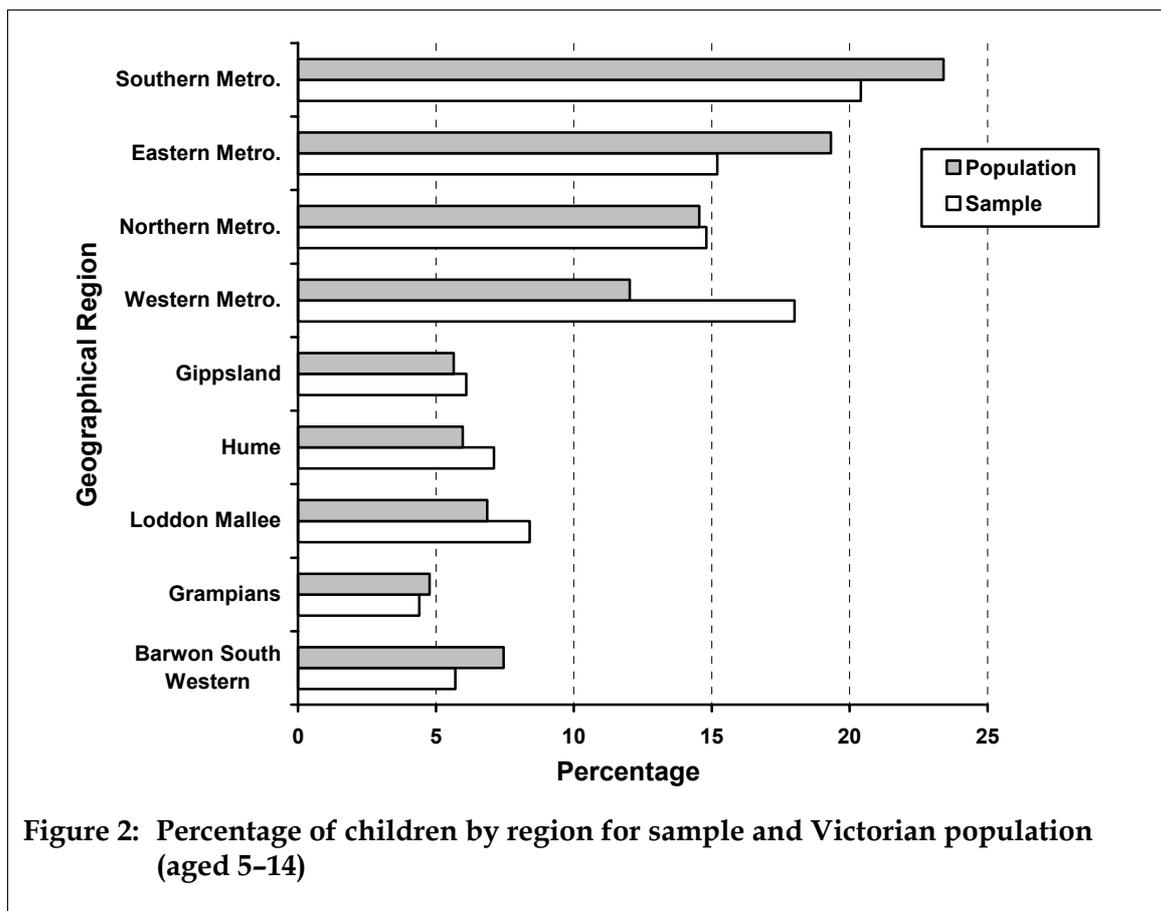
## Demographic composition of the sample

A total of 10,341 children aged 4 to 18 years were sampled in 2001 (see Table 2). The frequency distribution of children's ages peaked for children aged 6 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 ( $n = 26$ ) results for these age groups have been suppressed in the results to follow.

**Table 1: Sample size and assigned weight by region**

Region	Number Sampled	Weight
Barwon South Western	590	1.31
Grampians	453	1.09
Loddon Mallee	865	0.82
Hume	734	0.84
Gippsland	632	0.92
Western Metropolitan	1859	0.67
Northern Metropolitan	1528	0.98
Eastern Metropolitan	1572	1.27
Southern Metropolitan	2108	1.15



**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	9	17	1	27	7	18	1	26
5	412	462	0	874	411	454	0	864
6	818	761	0	1,579	817	756	0	1,573
7	770	702	3	1,475	776	701	4	1,481
8	749	703	10	1,462	747	700	11	1,458
9	668	676	7	1,351	674	671	8	1,353
10	708	643	8	1,359	709	639	10	1,358
11	603	601	9	1,213	607	598	10	1,215
12	334	315	4	653	338	324	4	666
13	114	101	2	217	117	98	2	218
14	63	41	1	105	63	37	1	101
15	6	4	0	10	7	3	0	11
16	3	6	1	10	3	6	1	11
17	3	1	0	4	3	1	0	4
18	0	2	0	2	0	2	0	2
<b>Total</b>	<b>5260</b>	<b>5035</b>	<b>46</b>	<b>10,341</b>	<b>5279</b>	<b>5009</b>	<b>52</b>	<b>10,341</b>

## Deciduous teeth

As can be seen in Table 3, the mean number of clinically detectable decayed teeth was highest for 7-year-olds and declined steadily to 0.28 for children aged 12 years. In contrast, the mean number of filled deciduous teeth increased to 1.03 for 8-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 1.74 for 5-year-olds to 2.28 for 7-year-old children before declining to 0.62 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 80.9% among 5-year-olds to 41.7% for children aged 11 (see Table 4). The percentage of children with no recorded caries experience in the deciduous dentition (% dmft = 0) reduced from 57.6% among 5-year-olds to a low of 44.6% among 8-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 <i>n</i>	Decayed (d)		Missing (m)		Filled (f)		dmft	
		mean	SD	mean	SD	mean	SD	mean	SD
4	26	1.63*	3.34*	0.04*	0.20*	0.47*	1.56*	2.14	3.96
5	864	1.34	2.52	0.12	0.80	0.29	1.07	1.74	3.08
6	1,573	1.27	2.10	0.12	0.67	0.46	1.26	1.85	2.83
7	1,481	1.35	2.17	0.13	0.65	0.79	1.62	2.28	3.03
8	1,458	0.99	1.70	0.18	0.65	1.03	1.76	2.20	2.77
9	1,353	0.87	1.44	0.14	0.65	0.96	1.61	1.97	2.54
10	1,358	0.67	1.17	0.10	0.45	0.82	1.44	1.58	2.16
11	1,215	0.39	0.97	0.07	0.47	0.50	1.10	0.96	1.83
12	666	0.28	0.79	0.04	0.26	0.30	0.84	0.62	1.45

\* 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	9	83.1	26	67.1
5	367	80.9	864	57.6
6	736	74.4	1,573	53.2
7	781	63.3	1,481	47.3
8	808	49.2	1,458	44.6
9	741	47.9	1,353	45.3
10	677	45.3	1,358	50.2
11	401	41.7	1,215	67.0
12	165	49.7	666	75.2

## 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 0.02 for 5-year-olds to 1.81 for 14-year-olds. The DMFT for 12-year-old children in 2001 was 0.92.

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, 59.4% 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	864	0.02*	0.33*	0.00	0.00	0.00	0.06*	0.02*	0.33*
6	1,573	0.08	0.40	0.00	0.00	0.01	0.20	0.09	0.46
7	1,481	0.24	0.71	0.01*	0.10*	0.04	0.24	0.28	0.78
8	1,458	0.30	0.75	0.01*	0.16*	0.11	0.52	0.42	0.97
9	1,353	0.33	0.76	0.01*	0.16*	0.19	0.61	0.54	1.02
10	1,358	0.33	0.79	0.01	0.14	0.24	0.68	0.59	1.10
11	1,215	0.37	0.82	0.01	0.15	0.31	0.74	0.68	1.16
12	666	0.45	0.98	0.06	0.44	0.41	0.93	0.92	1.53
13	218	0.67	1.41	0.05	0.28	0.67	1.40	1.38	2.27
14	101	0.95	1.87	0.11*	0.45*	0.76	1.42	1.81	2.55

\* 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	10	93.0	864	98.9
6	85	88.4	1,573	94.6
7	238	85.2	1,481	83.9
8	328	76.2	1,458	77.5
9	406	63.5	1,353	70.0
10	427	58.1	1,358	68.5
11	414	54.5	1,215	65.9
12	270	53.1	666	59.4
13	102	47.5	218	53.3
14	52	46.8	101	48.4

## All teeth

Untreated caries in the combined deciduous and permanent dentitions (see Table 7) existed for between 36.3% and 48.9% of children in any age group from 4 to 14 years. Within this range, the greatest likelihood of untreated decay occurred for 7-year-olds where only 51.1% 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 11.6% of 7-year-olds to 1.2% of 12-year-olds. This age trend indicates that the greatest contribution to high levels of clinically detectable caries came from the deciduous dentition.

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 88.8% of 5-year-olds had no fillings, this declined to 57.6% for 9-year-olds before increasing again to 66.4% for 12-year-old children. Similarly, the percentage of children with no caries experience (dmft+DMFT = 0) was age associated, reducing to 35.9% for 9-year-old children before increasing to 45.5% of children aged 13.

**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	26	60.8	11.1*	6.3*	4.1*	4.4*	13.3*	95.9	89.8	60.8
5	864	61.1	11.4	8.3	5.4	4.5	9.3	96.5	88.8	57.1
6	1,573	57.4	12.1	9.9	6.5	5.0	9.2	95.0	83.3	51.8
7	1,481	51.1	14.7	10.7	6.5	5.4	11.6	92.7	71.7	43.8
8	1,458	52.4	17.4	11.4	6.8	4.0	8.0	89.8	61.7	38.4
9	1,353	51.3	19.2	12.5	6.5	4.2	6.3	91.4	57.6	35.9
10	1,358	55.5	17.8	12.9	5.9	4.3	3.6	93.1	58.0	38.5
11	1,215	63.7	18.7	7.5	4.5	3.1	2.4	95.2	63.9	47.2
12	666	63.5	17.4	10.2	5.6	1.2	2.0	95.0	66.4	44.4
13	218	62.7	17.3	10.4	3.2	1.5*	4.9	95.7	65.7	45.5
14	101	63.0	13.0	9.3	4.2*	3.6*	6.8	91.9	64.4	44.9

\* relative standard error  $\geq$  40%

## Fissure sealants

The use of fissure sealants increased sharply for children across the age range of 6 to 12 (see Table 8), rising from a mean of 0.06 to a mean of 1.51, 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  $\geq$  1) than for those with no caries experience (DMFT = 0).

**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	1,573	0.06	0.43	1,488	1.7	85	6.6
7	1,481	0.26	0.88	1,243	7.8	238	16.0
8	1,458	0.61	1.31	1,131	19.8	328	23.6
9	1,353	1.10	1.58	947	34.2	406	43.1
10	1,358	1.33	1.66	931	41.3	427	50.8
11	1,215	1.37	1.69	801	44.9	414	52.5
12	666	1.51	1.87	396	47.6	270	54.7
13	218	1.35	1.68	116	40.2	102	57.6
14	101	2.00	2.85	49	34.3	52	64.2

## 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. Fewer than 16% of children aged over 8 years of age had had a previous examination within the preceding 12 months. The most common time period since a previous examination for these children was greater than 2 years. Substantial percentages of children aged 7 years or more had also had their previous examination between 19 months and 24 months previously. For 12-year-old children who had previously had an examination, 32.1% had had an examination within the previous 2 years.

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

Age	Children	Months since last visit					mean	SD
		0–6	7–12	13–18	19–24	25+		
	<i>n</i>	%	%	%	%	%		
4	1	0.0	0.0	100.0	0.0	0.0	16.70*	–
5	14	65.9	34.1	0.0	0.0	0.0	4.51*	3.82*
6	92	31.7	33.1	22.3	7.6	5.3	16.04	37.32
7	456	6.4	51.3	20.6	20.5	37.1	22.65	29.24
8	842	4.0	11.1	10.8	12.9	61.2	32.63	53.96
9	916	3.7	9.1	10.6	13.8	62.8	30.82	42.55
10	932	3.5	8.0	9.5	13.1	65.9	33.63	49.60
11	853	3.0	6.8	8.7	13.1	68.5	33.18	44.48
12	464	2.4	8.9	7.5	13.3	67.9	32.29	40.79
13	150	1.3	6.7	10.5	16.7	64.8	41.89	74.27
14	68	1.2	2.2	7.1	12.5	77.0	71.16	119.33

\* relative standard error ≥ 40%

The mean time since last examination increased from 16.04 months for 6-year-old children to 71.16 months for children aged 14 years old. For 6-year-olds, 87.1% had their last exam 0–18 months previously whereas only 18.8% of 12-year-olds had their last exam 0–18 months previously.

## 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 Barwon South Western regions (means = 2.25 and 2.14 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, Grampians the highest of any region and Eastern Metropolitan the lowest. Mean dmft scores ranged from 1.17 in the Eastern Metropolitan region to 3.65 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 again for Grampians (mean = 1.38) with the lowest mean score in the Eastern Metropolitan region (mean = 0.51).

**Table 10: Five–six-year-old deciduous 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	97	2.14	2.58	0.23	1.13	0.37	0.95	2.74	3.27
Grampians	116	2.25	2.64	0.47	1.51	0.93	1.81	3.65	3.73
Lodden Mallee	213	2.06	2.85	0.27	1.00	0.70	1.61	3.02	3.78
Hume	158	1.84	2.79	0.13	0.77	0.47	1.25	2.44	3.37
Gippsland	133	1.84	2.60	0.11	0.60	0.59	1.48	2.55	2.94
Western Metropolitan	454	1.25	2.20	0.09	0.65	0.33	1.22	1.68	2.81
Northern Metropolitan	423	1.03	2.04	0.08	0.47	0.33	0.93	1.44	2.47
Eastern Metropolitan	386	0.85	2.04	0.06	0.59	0.25	0.93	1.17	2.52
Southern Metropolitan	473	0.99	1.78	0.06	0.44	0.35	1.17	1.39	2.49

**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	119	0.43	0.82	0.12	0.64	0.41	0.83	0.96	1.41
Grampians	77	0.73	1.23	0.01	0.11	0.64	1.17	1.38	1.65
Lodden Mallee	185	0.39	0.86	0.03	0.31	0.46	0.95	0.89	1.38
Hume	157	0.35	0.74	0.00	0.00	0.52	1.09	0.87	1.39
Gippsland	135	0.67	1.18	0.07	0.43	0.54	0.98	1.29	1.61
Western Metropolitan	285	0.55	1.07	0.03	0.30	0.28	0.71	0.87	1.34
Northern Metropolitan	221	0.29	0.69	0.03	0.29	0.27	0.67	0.59	1.08
Eastern Metropolitan	292	0.28	0.80	0.00	0.00	0.23	0.65	0.51	1.13
Southern Metropolitan	395	0.34	0.80	0.02	0.18	0.27	0.74	0.63	1.19

## 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, water fluoridation status and the child's country of birth in Table 12. In the deciduous dentition, males had a dmft score 20.7% higher than females, while the opposite trend occurred in the permanent dentition with females having higher caries experience (18.6% 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 73.8% higher than non-card holders in the corresponding age group. This difference was also marked in the permanent dentition, where 11–12-year-old children covered by a health care card had a mean DMFT score 52.5% higher than non-card holding children in this age group.

The addition of fluoride to water supplies has long been recommended as a caries preventive population-level oral health initiative. In Victoria, it is predominantly metropolitan and surrounding areas that have been fluoridated. In the deciduous dentition, children residing in non-fluoridated areas had twice the number of decayed, missing and filled teeth as did children residing in fluoridated areas. In the permanent dentition, 11–12-year-old children in non-fluoridated regions had a mean DMFT 58.7% higher than for children in fluoridated regions.

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 the Americas, Southern and Central Asia, and North-West Europe, with children born in Australia having the fifth lowest caries experience. The highest mean dmft occurred for children born in North-East and South-East Asia, North Africa and Middle East, and in New Zealand and Other Oceania. The highest DMFT occurred for Zealand and Other Oceania, Southern and Eastern Europe, Northern America and Sub-Saharan Africa. In the deciduous dentition, mean dmft of those children born in

North East Asia (mean = 2.95) was approximately 1.7 times higher than that of children born in Australia (mean = 1.75). Among 11–12-year-olds the mean DMFT score of children born in Sub-Saharan Africa (mean = 1.05) was approximately one and a third times higher than the caries experience of children born in Australia (mean = 0.78).

**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	1,227	1.98	3.13	945	0.70	1.26
Female	1,210	1.64	2.68	922	0.83	1.33
Card Status						
Non Card Holder	1,051	1.26	2.35	693	0.61	1.16
Health Care Card	795	2.19	3.10	642	0.93	1.48
Pensioner Card	591	2.28	3.39	545	0.78	1.25
Fluoridation status						
Fluoridated	1,708	1.39	2.51	1,232	0.63	1.18
Non-fluoridated	621	2.77	3.49	585	1.00	1.46
Country of Birth						
Australia	1,727	1.75	2.83	1,377	0.78	1.32
New Zealand and Other Oceania	70	2.05	2.67	69	0.89	1.16
North-West Europe	136	1.30	2.55	99	0.68	1.26
Southern and Eastern Europe	85	1.86	2.96	74	0.89	1.66
North Africa and Middle East	77	2.35	3.37	49	0.61	0.91
South-East Asia	152	2.71	3.81	97	0.70	1.27
North-East Asia	49	2.95	3.90	26	0.69	1.25
Southern and Central Asia	67	1.24	2.39	42	0.30	0.78
Northern America	12	1.04	1.71	4	0.90	1.36
Other Americas	12	0.62	0.99	15	0.45	0.87
Sub-Saharan Africa	19	1.78	2.51	23	1.05	1.50
Not Known	8	0.95	1.54	–	–	–

## Selected trends, 1997–2001

Presented below is a table and a series of figures of selected 5-year trends across the period 1991–2001. Trends are proved for sample size, deciduous and permanent caries experience, fissure sealants and time since last visit.

**Table 3: Sample size and percentage of total sample by region**

Region	1997		1998		1999		2000		2001	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Barwon South Western	1085	10.8	785	9.2	828	7.9	463	5.1	590	5.7
Grampians	458	4.5	364	4.2	593	5.6	521	5.8	453	4.4
Loddon Mallee	933	9.3	558	6.5	796	7.6	769	8.5	865	8.4
Hume	600	6.0	569	6.6	915	8.7	798	8.8	734	7.1
Gippsland	504	5.0	674	7.9	8	0.0	530	5.9	632	6.1
Western Metropolitan	1495	14.8	948	11.1	1447	13.8	1209	13.4	1859	18.0
Northern Metropolitan	1260	12.5	1590	18.5	1989	18.9	1581	17.5	1528	14.8
Eastern Metropolitan	1818	18.1	1260	14.7	1864	17.7	1512	16.7	1572	15.2
Southern Metropolitan	1919	19.1	1825	21.3	2072	19.7	1672	18.5	2108	20.4
<i>Total</i>	<i>10115</i>	<i>100.0</i>	<i>8613</i>	<i>100.0</i>	<i>10512</i>	<i>100.0</i>	<i>8707</i>	<i>100.0</i>	<i>10341</i>	<i>100.0</i>

