



The Child Dental Health Survey Tasmania 1998

AIHW Dental Statistics and Research Unit
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AIHW Dental Statistics and Research Unit
Adelaide University
SOUTH AUSTRALIA 5005

Phone: (08) 8303 4051
(08) 8303 5027
Fax: (08) 8303 4858

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DSRU Staff:

Director:	Professor John Spencer
Acting Deputy Director:	Dr Kaye Roberts-Thomson
Senior Research Fellow:	Dr David Brennan
Research Officers:	Mr Jason Armfield Mr Knute Carter Dr Jane Chalmers Ms Liana Luzzi Mrs Judy Stewart
Research Associates:	Ms Kelly Jones Dr Suzanna Mihaildis
General Staff:	Mrs Leonie Jeffery Mrs Lorna Lucas Mrs Ruth Wass
Consultants:	Dr Mike Morgan (<i>University of Melbourne</i>) Dr Gary Slade (<i>University of North Carolina</i>)

Any comments or information relevant to the subject matter of this report would be welcome. Correspondence should be directed to:

The Director
AIHW Dental Statistics and Research Unit
The University of Adelaide
SOUTH AUSTRALIA 5005

Tel: (08) 8303 4051
Fax: (08) 8303 4858
E-mail: aihw.dsru@adelaide.edu.au
Website: <http://www.adelaide.edu.au/socprev-dent/dsru>

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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 is part of the annual series providing descriptive statistics concerning child dental health in Tasmania. Information listed in the report includes the age and sex of children in the sample, their deciduous and permanent caries experience, frequency of fissure sealants, immediate treatment needs, history of school dental service examinations and regional analyses.

The sections below also provide a simple, summary statement highlighting differences between the 1998 and 1997 findings. However, no formal hypothesis tests have been undertaken and descriptions of differences between years are intended as a guide to the reader rather than an evaluation of the significance of any trends.

Sources of subjects and sampling

The data for this report were collected during the 1998 calendar year from patients of the Tasmania Dental Service by dental therapists and dentists. A random sampling procedure was used to select slightly less than one in two (1:1.9) patients. This was achieved by selecting those children whose birthday fell on the first sixteen days of any month.

Data preparation

Data were collected and hand entered in Tasmania before forwarding to the AIHW Dental Statistics and Research Unit (DSRU) for analysis.

The data were cleaned prior to analyses to correct data recording and data entry errors. In addition to a visual check of a number of cases with erroneous data, a series of linear regressions of age on the number of deciduous, permanent and total teeth revealed numerous outliers with standardised residuals greater than 3 standard deviations from the mean. A visual check allowed many of these cases to be corrected where it was evidently a data recording error. A number of cases with apparent errors that could not be reconciled were removed from the data set.

Data analysis

Data were weighted for all analyses to more accurately reflect the child population in Tasmania for 1998. Weights were applied according to region, as used by the Tasmanian Department of Health and Human Services. In contrast to 1998, Hobart was analysed separately to the remainder of the Southern region. Hobart was taken to comprise clinics in the Statistical Local Areas of Hobart Inner, Hobart Remainder, Glenorchy and Clarence. The Hobart region included children from clinics in the Hobart, Glenorchy and Eastern Shore districts as well as several clinics from the Sorrel district.

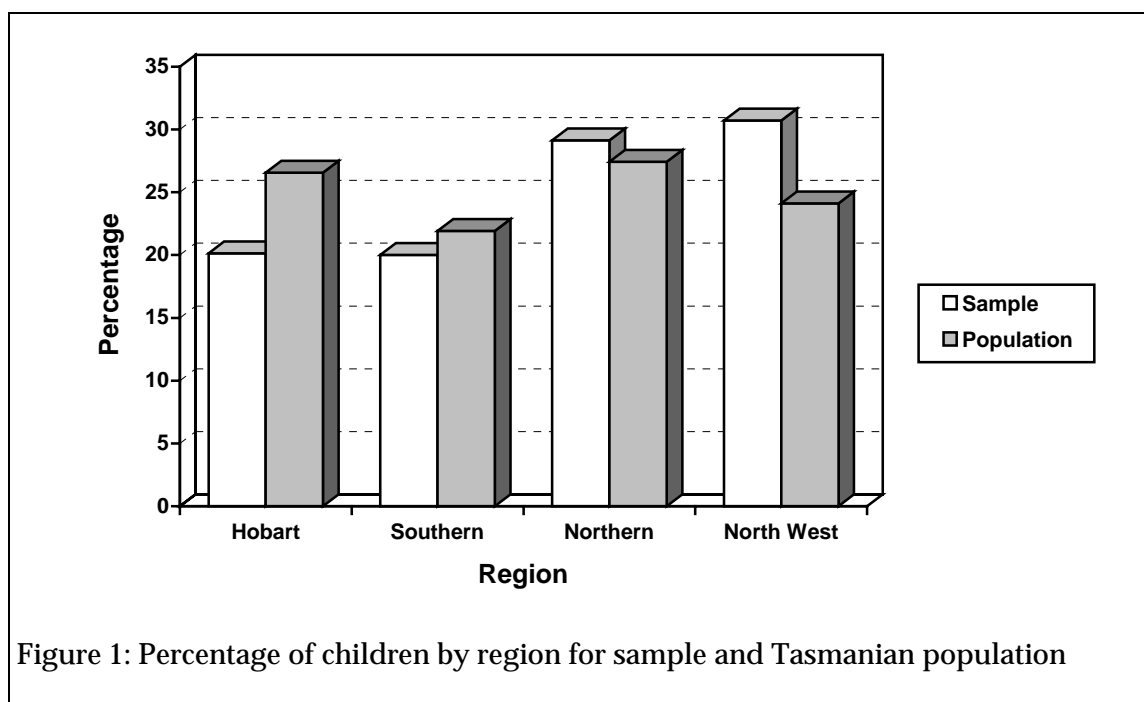
Children from the Hobart and Southern regions were initially under-represented in the sampling whereas children from the Northern and North West regions were over-represented relative to actual population distribution (see Figure 1). Weighting was carried out so that the regional contributions for the study were proportional to the

distribution of children aged 5–14 years in Tasmania as at 30 June 1998. Children aged 5–14 years of age comprised 88.0% of the 1998 sample.

All data were also weighted by months since last visit (which was used due to the under-representation of students on longer recall schedules in the sample). Again, this weighting protocol was adopted in order to obtain a sample with characteristics representative of those of the student population covered by the School Dental Service of Tasmania for 1998.

Previous Tasmanian Child Dental Health Survey reports have included children with no deciduous teeth in the analyses of deciduous caries experience, effectively giving these children scores of 0 for decayed, missing and filled teeth. Including children with no deciduous teeth in analyses understates the total level of caries experience of children aged between 10 and 12. Similarly, children with no permanent teeth have previously been included in analyses of permanent caries experience, understating the level of permanent caries experience in younger children. As a result, these children are no longer included in the respective analyses, so comparisons of the deciduous caries experience of 10–12-year olds and the permanent caries experience of 4–6-year-olds between 1997 and 1998 should be interpreted with due appreciation of the change in caries experience calculations.

All indices are calculated from data collected over a 12-month period. Age-specific indices denoted with an asterisk (*) are those in which the relative standard error exceeds 40% and population estimates of these indices may be considered to be statistically unreliable and should be interpreted with due care.



Demographic composition of the sample

There was a total of 5,921 people in the sample for 1998 (see Table 1). The majority of the children were aged between 4 and 15 years of age (97.7%) with the highest frequencies being for children aged between 5 and 11 years of age. This corresponds to the predominant ages of the primary school population. For all subsequent analyses children aged 2–4 years old were collapsed into a single group, as were children aged 16–18 years.

Males and females were represented in approximately equal proportions across the age groups although slightly more males than females were sampled overall. This is consistent with the distribution in these age groups within the Tasmanian population. Weighting of the data did not produce appreciable differences in the age and sex composition of the sample.

Changes in demographic composition since 1997

There was a large drop ($n = 4,580$) in the number of children sampled in 1998 than in 1997 with decreased numbers sampled in all age groups. The sex distribution across years was comparable.

Table 1: Demographic composition of the sample

Age	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>
2	19	26	0	45	17	23	0	40
3	51	28	1	80	46	26	1	73
4	140	141	7	288	127	134	6	267
5	318	296	7	621	305	282	7	594
6	331	275	4	610	312	259	4	576
7	305	292	6	603	303	287	5	595
8	299	278	5	582	290	277	5	572
9	295	277	3	575	288	282	2	572
10	276	257	5	538	298	261	7	566
11	272	269	4	545	287	267	4	558
12	216	219	2	437	203	218	1	422
13	186	191	4	381	192	201	3	396
14	144	173	1	318	153	187	1	341
15	134	151	2	287	157	177	4	338
16	4	2	0	6	4	1	0	5
17	1	3	0	4	1	4	0	5
18	0	1	0	1	0	1	0	1
Total	2,991	2,879	51	5,921	2,983	2,888	50	5,921

Deciduous teeth: age-specific experience

Table 2 shows the age specific caries experience in deciduous teeth for children up to 12 years of age. The mean number of clinically detectable decayed deciduous teeth decreased consistently, from 1.32 among children up to 4 years old to 0.31 among 12-year-olds. In contrast, the mean number of filled teeth increased with age, from 0.17 for the youngest children to 1.12 for 10-year-olds, before declining for 11- and 12-year-olds due to the exfoliation of deciduous teeth. At age 11, children retained on average only 30% of the deciduous teeth present at age 5. Mean dmft decreased from 1.55 at age ≤ 4 to 1.40 for 6-year-olds, increased to 1.75 for 9-year-olds, and subsequently declined into the older age groups.

For those children up to the age of 4, 88.5% of their dmft score could be attributed to untreated decay (see Table 3). This figure declined systematically with increasing age so that by 10 years of age only 27.0% of childrens' dmft score was attributable to decay. The percentage of children up to the age of 8 with a dmft score of 0 declined with age.

Table 2: Deciduous dentition – decayed, missing and filled teeth by age

Age	Children <i>n</i>	Teeth			Decayed (d)		Missing (m)		Filled (f)		dmft	
		mean	mean	SD	mean	SD	mean	SD	mean	SD	mean	SD
≤ 4	379	19.72	1.32	2.50	0.06	0.45	0.17	0.86	1.55	2.83		
5	594	19.50	1.03	2.13	0.06*	0.71	0.36	1.18	1.46	2.86		
6	576	17.38	0.81	1.83	0.03*	0.28	0.55	1.31	1.40	2.58		
7	595	14.45	0.77	1.37	0.09	0.69	0.73	1.53	1.59	2.47		
8	572	12.15	0.68	1.21	0.05	0.41	1.00	1.74	1.73	2.31		
9	567	10.74	0.58	1.16	0.05	0.44	1.11	1.81	1.75	2.42		
10	523	9.04	0.41	0.84	0.03*	0.32	1.12	1.68	1.55	2.11		
11	383	5.90	0.27	0.72	0.02*	0.29	0.63	1.25	0.93	1.64		
12	206	4.72	0.31	0.69	–	–	0.68	1.25	0.99	1.48		

* relative standard error $\geq 40\%$

Table 3: Deciduous teeth – caries experience indices by age

Age	Teeth		d/dmft		dmft=0	
	mean	<i>n</i>	<i>n</i>	%	<i>n</i>	%
≤ 4	19.72	149	149	88.5	379	60.9
5	19.50	231	231	74.9	594	61.1
6	17.38	223	223	60.7	576	61.2
7	14.45	280	280	54.0	595	52.9
8	12.15	292	292	44.6	572	48.9
9	10.74	280	280	37.5	567	50.6
10	9.04	269	269	27.0	523	48.6
11	5.90	148	148	33.0	383	61.2
12	4.72	94	94	35.9	206	54.2

Approximately 61% of children up to the age of 4 had dmft=0 while only 48.6% of children aged 10 had no clinically detectable caries experience.

Changes in deciduous caries experience since 1997

In 1998, compared to 1997, the mean number of teeth with clinically detectable decay decreased for 6-, 10- and 11-year-old children but increased for all the other age groups. Consistent with the changes in mean decay, mean dmft scores also increased for some age groups and is especially apparent for the youngest children. There were inconsistent changes in both d/dmft and the percentage of children with no history of caries experience (dmft=0).

Permanent teeth: age-specific experience

The mean number of decayed, filled and DMF teeth all increased in a fairly consistent manner, but at differing rates, across increasing age groups (see Table 4). As a consequence, the percentage of DMFT due to decay (D/DMFT) declined across age groups (see Table 5). The percentage of caries free children (DMFT=0) also declined regularly with increasing age, from 98.6% for children up to 4 years of age to 45.9% for 12-year-olds. The 12-year-old DMFT was 1.39.

Changes in permanent caries experience since 1997

Often considerable increases in clinically detectable decay were found for all age groups over that of 7-year-olds in 1998 compared to 1997, with the only exception being for 10-year-olds. Mean decay in 12-year-olds was 62% higher in 1998 than in 1997. However, the percentage of people with DMFT=0 changed little between 1997 and 1998, indicating not more people with caries but an increase in severity for those with caries experience.

Table 4: Permanent dentition – decayed, missing and filled teeth by age

Age	Children <i>n</i>	Teeth mean	Decayed (D)		Missing (M)		Filled (F)		DMFT	
			mean	SD	mean	SD	mean	SD	mean	SD
5	135	3.39	0.02*	0.17*	–	–	–	–	0.02*	0.17*
6	446	5.68	0.05	0.27	–	–	0.01*	0.12*	0.06	0.31
7	579	8.59	0.16	0.54	–	–	0.04	0.28	0.19	0.62
8	570	11.25	0.26	0.75	0.00	0.08*	0.12	0.48	0.38	0.92
9	572	12.90	0.25	0.67	–	–	0.24	0.64	0.49	0.96
10	566	15.58	0.28	0.71	0.00	0.06*	0.31	0.80	0.60	1.10
11	558	20.93	0.45	1.06	0.04*	0.45*	0.40	0.84	0.89	1.48
12	422	23.92	0.68	2.04	0.05	0.35	0.67	1.04	1.39	2.36
13	396	26.27	0.70	1.42	0.01*	0.16*	0.81	1.43	1.51	2.18
14	341	27.20	0.78	1.45	0.06	0.35	1.00	1.44	1.85	2.31
15	338	27.56	1.08	1.98	0.06	0.40	1.11	1.56	2.25	2.60
≥16	11	27.39	0.64*	1.50*	0.19*	0.76*	2.14	1.88	2.97	2.47

* relative standard error ≥ 40%

Table 5: Permanent dentition – caries experience indices by age

Age	Teeth		D/DMFT		DMFT=0	
	mean	n	%	n	%	
5	3.39	2	100.0	135	98.6	
6	5.68	21	86.9	446	95.3	
7	8.59	66	80.6	579	88.5	
8	11.25	116	65.1	570	79.7	
9	12.90	145	50.0	572	74.7	
10	15.58	184	54.2	566	67.5	
11	20.93	225	48.3	558	59.6	
12	23.92	228	39.4	422	45.9	
13	26.27	203	45.3	396	48.7	
14	27.20	202	37.8	341	40.8	
15	27.56	224	40.5	338	33.5	
≥16	27.36	8	16.9*	11	31.6	

* relative standard error ≥ 40%

All teeth: age-specific experience

It can be seen from Table 6 that untreated clinical decay in the combined deciduous and permanent dentitions ($d+D \geq 1$) existed for between 30.8% and 39.5% of children up to the age of 15. The greatest likelihood of untreated decay occurred for 7- and 8-year-olds. However, the most extensive levels of untreated clinical decay ($d+D=5$ or more) occurred most frequently in the youngest and the oldest children.

Table 6: All teeth – age-specific caries experience

Age	Children	d + D =						m+M=0	f+F=0	dmft+DMFT=0
		0	1	2	3	4	5+			
	n	%	%	%	%	%	%	%	%	
≤4	379	62.5	9.2	9.2	4.6	5.7	8.7	97.7	93.9	60.6
5	594	65.6	11.0	7.8	5.4	3.3	6.9	99.0	85.9	60.1
6	576	67.1	12.7	8.7	3.6	3.3	4.5	98.6	77.6	59.2
7	595	60.9	13.8	12.8	4.9	3.5	4.0	97.4	70.3	49.3
8	572	60.5	16.6	8.5	8.3	2.3	3.9	97.7	61.2	44.2
9	572	64.8	12.4	11.3	5.4	2.6	3.5	98.1	55.4	43.6
10	566	61.8	22.8	9.5	3.0	1.2	1.7	98.3	52.8	39.9
11	558	68.7	16.6	6.8	2.4	2.4	3.1	98.2	63.1	45.6
12	422	65.1	16.7	10.3	4.0	1.7	2.2	97.6	52.6	38.5
13	396	69.2	10.5	9.8	4.4	2.3	3.8	99.0	62.9	46.4
14	341	66.6	12.7	8.2	7.6	1.7	3.2	96.2	54.9	39.1
15	338	61.9	12.5	9.6	5.5	4.0	6.6	97.0	53.7	33.5
≥16	11	81.8	0.0	0.0	8.1*	10.1*	0.0	93.8	31.6	31.6

* relative standard error ≥ 40%

While fewer than 4% of children aged up to 15 had at least one deciduous or permanent tooth missing due to caries, considerably higher percentages presented with fillings. The prevalence of fillings increased to 47.2% for 10-year-olds, decreased to 37.1% for 13-year-olds, and then increased again.

There was a reasonably consistent decline in the percentage of children with no caries experience in either the deciduous or permanent dentition (dmft+DMFT=0), from 60.6% among the youngest children to 39.9% at age 10. The percentage varied between 46.4% and 31.6% among the older ages.

Changes in caries experience for all teeth since 1997

Given changes in the caries experience of both deciduous and permanent teeth, the percentage of children with d+D=0 in a number of the age groups has reduced and there has been an increase in the percentages of children with detectable decay in these age groups. Overall, however, there was little change in the percentage of children with d+D≥4 in 1998 than in 1997. No other systematic changes in caries experience occurred between these years.

Fissure sealants: age-specific experience

Data for fissure sealants are presented in Table 7. Prevalence of fissure sealants increased with increasing age. In all age groups there was evidence of preferential use of fissure sealants among those with caries experience. For example, 33.9% of 12-year-olds with permanent caries experience (DMFT≥1) had fissure sealants, compared with 21.7% among those with DMFT=0.

Table 7: Fissure sealants – age-specific experience

Age	Children <i>n</i>	Sealants		Students with sealants			
				DMFT=0		DMFT≥1	
		mean	SD	<i>n</i>	%	<i>n</i>	%
6	446	0.02*	0.24*	425	0.4*	21	13.8
7	579	0.10	0.51	512	3.9	66	13.6
8	570	0.33	0.97	455	8.3	116	24.4
9	572	0.54	1.18	427	16.6	145	32.8
10	564	0.54	1.19	380	15.9	184	29.1
11	558	0.51	1.17	333	13.3	225	29.3
12	422	0.75	1.51	194	21.7	228	33.9
13	396	0.78	1.57	193	18.2	203	36.2
14	341	0.98	1.89	139	28.0	202	34.8
15	338	1.01	1.77	113	27.3	224	41.5
≥16	11	0.54*	1.00*	4	0.0	8	41.2

* relative standard error ≥ 40%

Changes in fissure sealant experience since 1997

There were small increases in the number of children with fissure sealants across some age groups between 1997 and 1998 with similar sized increases in the mean number of sealants placed per child for 4 of the age groups. Increases in fissure sealant placement were seen mainly in those children with DMFT \geq 0.

Immediate treatment needs

As shown in Table 8, only a small number of children were indicated as being in immediate need of treatment (1.1% of the total sample). This classification is accorded to children who have, or who are likely to develop within four weeks, oral pain or infection. The mean dmft or DMFT of all children indicated for immediate treatment was appreciably higher than for the respective age group in the sample total, although due to the small numbers of children in immediate need these figures are not statistically reliable.

Changes in immediate treatment needs since 1997

In 1997, only 0.7% of children were classified as being in need of immediate treatment. Comparisons between years are not reliable due to the small number of children classified as in immediate need.

Table 8: Immediate treatment needs: age-specific distribution

Age	Children		dmft		DMFT		% with d+D=				
	n	%	mean	SD	mean	SD	0	1	2	3	4+
≤4	8	2.2	3.72	4.20	–	–	27.5*	11.5*	22.9*	0.0	38.2
5	9	1.4	4.59	3.52	–	–	0.0	22.6*	10.8*	9.0*	57.6
6	2	0.4*	1.77*	2.40*	–	–	40.4*	0.0	40.4*	0.0	19.2*
7	5	0.8	3.10	2.66	0.44*	1.20*	0.0	53.4	31.9*	0.0	14.8*
8	8	1.5	4.06	3.15	0.67*	0.99*	0.0	43.0	11.3*	0.0	45.7
9	5	0.9	3.71	2.27	0.95*	1.06*	42.1*	57.9	0.0	0.0	0.0
10	6	1.1	2.41	1.66	0.77*	1.18*	10.0*	36.2*	41.7	12.1*	0.0
11	2	0.4*	1.64*	2.95*	2.28*	2.22*	38.7*	13.5*	39.7*	8.1*	0.0
12	6	1.5	0.28*	0.60*	1.13*	1.44*	41.2	39.2	9.3*	10.3*	0.0
13	5	1.2	0.35*	0.76*	5.42	2.60	0.0	11.2*	11.8*	40.5*	36.6*
14	7	2.1	–	–	3.72	2.97	28.6*	3.6*	0.0	13.4*	54.5
15	5	1.6	–	–	2.88	0.86	0.0	37.1*	0.0	38.2*	24.7*
≥16	0	0.0	–	–	–	–	–	–	–	–	–

* relative standard error \geq 40%

School Dental Service examinations

Table 9 describes the percentage of children who were new patients (having had no previous dental examination) in the Tasmanian School Dental Service. The figure was highest for the youngest ages (6 years or less) while no more than 8% of those aged 7 years or more had had no previous examination. This pattern is expected and indicates that most patients are enrolled during their early school years.

Table 9: School Dental Service examinations – age-specific distribution

Age	Children examined <i>n</i>	Previous examination in School Dental Service		
		No %	Yes %	Unknown %
≤4	390	76.4	23.6	0.0
5	626	52.0	48.0	0.0
6	624	14.6	85.4	0.0
7	611	7.4	92.6	0.0
8	594	5.2	94.8	0.0
9	573	3.3	96.7	0.0
10	542	2.5	97.5	0.0
11	550	2.6	97.4	0.0
12	428	1.2	98.8	0.0
13	373	2.1	97.9	0.0
14	312	1.7	98.3	0.0
15	291	3.4	96.6	0.0
≥16	9	0.0	100.0	0.0

Table 10: 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	92	14.5	27.3	44.3	9.2	4.6	13.07	5.74
5	301	5.8	43.1	41.2	7.5	2.3	13.32	5.01
6	533	4.3	33.0	53.9	7.7	1.0	13.59	3.75
7	566	2.8	29.1	56.3	8.0	3.8	14.50	4.71
8	563	4.2	28.8	55.9	7.7	3.4	14.41	6.34
9	554	2.4	27.6	55.0	10.5	4.4	14.88	5.28
10	528	1.4	26.1	58.5	9.4	4.7	15.71	9.59
11	535	6.1	27.2	52.3	9.8	4.6	15.23	10.20
12	423	4.0	28.9	52.1	10.4	4.7	14.70	5.79
13	365	2.5	32.8	41.4	13.0	10.4	15.77	6.86
14	306	1.6	29.7	47.4	8.5	12.8	16.26	6.74
15	281	1.9	38.5	32.8	11.7	15.0	17.38	10.43
≥16	9	0.0	17.1*	57.2	8.6*	17.1*	17.97*	8.34*

* relative standard error ≥ 40%

Table 10 refers only to children with previous examinations, and indicates the time since their last dental examination. Approximately 26–33% of children in most ages received examinations within 7 to 12 months of their previous examination. A re-examination interval of 13–18 months years occurred for the majority of children (between 41.2% and 58.5% of 5–15 year-olds). Re-examination within 6 months was only common among the youngest children (≤ 4 years of age) whereas re-examination after a period of more than 18 months occurred most frequently among older children (aged 13 years or more). Mean time since last examination ranged from 13.07 months for the youngest children to 17.38 months for 15-year-olds.

Average recall periods for 6- and 12-year-old children are shown in Figure 2.

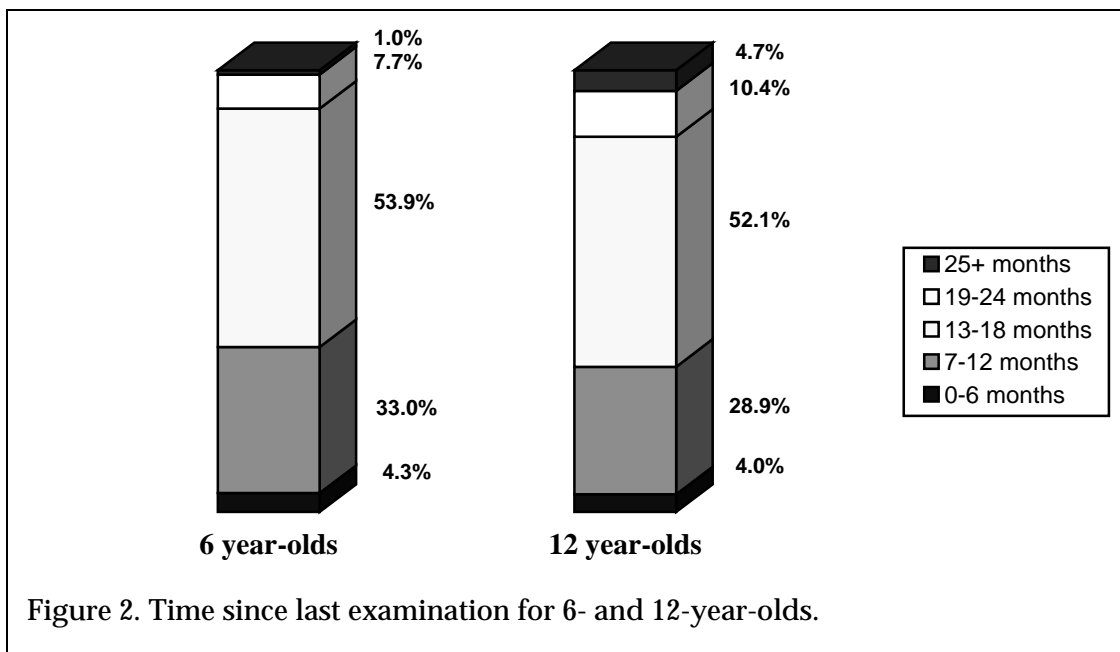


Figure 2. Time since last examination for 6- and 12-year-olds.

Changes in dental service examination patterns since 1997

In 1998 slightly more children had had a previous examination than in 1997 and this is mostly evident in the youngest age groups. Of those children who had received a previous examination, there was an increase for 9 of the 13 age groups having received the examination 7–12 months previously and a corresponding decrease in the percentage having had the examination more than 13 months previously. A decrease was also evident in mean time since last visit for children aged 6, 8 and 9 and for those aged between 12 and 14 years of age.

Percentage of children with dmft=0, DMFT=0 and d+D≥4

Figure 3 presents data contained in Tables 3, 5 and 6 and summarises percentage of children with no caries experience and the extent of more extensive untreated decay, represented by the percentage with d+D=4 or more.

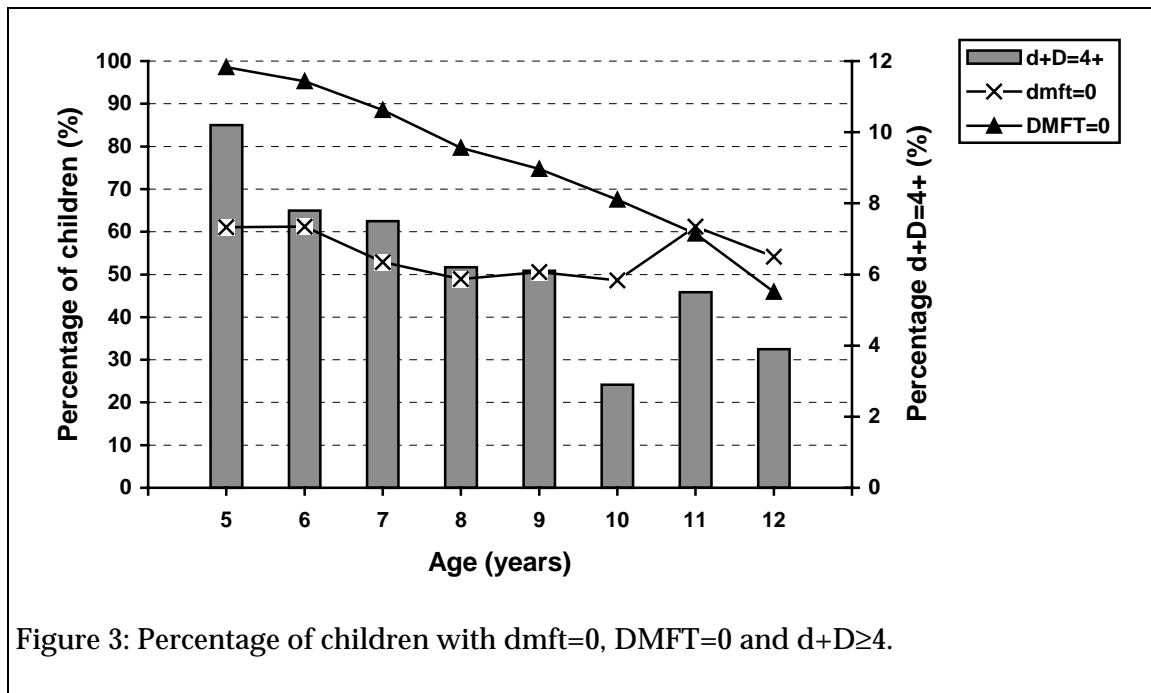


Figure 3: Percentage of children with dmft=0, DMFT=0 and d+D≥4.

Caries experience by geographical region

Table 11 presents deciduous caries experience data for each of the regions used in this report. Considerable variation can be seen in caries experience for the selected 5–6-year-old age group across geographical areas. Among these children, mean decay scores in the deciduous dentition ranged from 0.72 in Hobart to 1.12 in the North West region. The mean number of teeth missing due to caries was also highest in the North West region. The mean number of filled teeth was highest in the Northern and North West regions, the lowest being in Hobart. Mean dmft scores were again highest in the North West and lowest in Hobart. Consistent with these findings, the highest percentage of 5-6-year-olds with no recorded caries experience was in Hobart while the lowest was in the North West region.

Table 11: Deciduous caries experience for 5–6-year-old children by region

	Children	Decayed (d)		Missing (m)		Filled (f)		dmft		dmft=0
	<i>n</i>	mean	SD	mean	SD	mean	SD	mean	SD	%
Hobart	261	0.72	1.56	0.04	0.51	0.30	0.97	1.05	2.24	67.8
Southern	270	0.86	2.23	0.03	0.31	0.45	1.13	1.34	2.75	62.2
Northern	370	0.91	1.77	0.04	0.51	0.64	1.58	1.58	2.76	58.1
North West	318	1.12	2.06	0.05	0.41	0.61	1.43	1.78	2.86	54.7

The mean number of clinically detectable decayed teeth in 12-year-olds (see Table 12) was also highest in the North West region, however, contrary to trends in the deciduous dentition, mean scores were lowest in the Northern region. The mean number of filled teeth was again highest in the North West (mean = 0.90) and lowest in Hobart (mean = 0.49) and this pattern was repeated in mean DMFT scores, being 1.71 in the North West and 0.96 in Hobart. Approximately 50% of 12-year-olds in the Hobart and Northern regions had no history of caries experience in their permanent dentition, while only 38.9% of 12-year-old children in the North West had a DMFT score of zero.

Table 12: Permanent caries experience for 12-year-old children by region

	Children	Decayed (D)		Missing (M)		Filled (F)		DMFT		DMFT=0
	<i>n</i>	mean	SD	mean	SD	mean	SD	mean	SD	%
Hobart	74	0.47	1.01	0.00	0.00	0.49	0.80	0.96	1.33	51.4
Southern	71	0.65	2.21	0.09	0.54	0.66	1.00	1.41	2.34	42.3
Northern	145	0.39	1.18	0.02	0.14	0.68	1.06	1.09	1.69	52.4
North West	144	0.74	1.46	0.07	0.44	0.90	1.30	1.71	2.32	38.9