The Child Dental Health Survey, Australian Capital Territory 1998

AIHW Dental Statistics and Research Unit
The University of Adelaide

in collaboration with
The Australian Capital Territory School Dental Service

AIHW Catalogue No. DEN 80

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Suggested citation

AIHW Dental Statistics and Research Unit (2001). *Child Dental Health Survey, Australian Capital Territory 1998*.

Acknowledgments

These data used for this report were collected in collaboration with the Australian Capital Territory School Dental Service. The support of the service and its staff was crucial to the successful collection of data for this survey.

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Printed in Australia by The University of Adelaide, Adelaide.

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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 the Australian Capital Territory. The report contains tables and figures. 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 and children's history of School Dental Service examinations. The figures combine and summarise information from four of the tables.

The following sections briefly describe the tables and figures of this report and provide a simple, summary statement highlighting differences between the 1997 and 1998 findings. However, no formal hypothesis tests have been undertaken and descriptions of difference between years are intended as a guide to the reader rather than an evaluation of trends.

Sampling and data analysis

Data were collected during the 1998 calendar year from patients of the ACT School Dental Service by dental therapists and dentists. A random sampling procedure was used to select approximately one in two (1:2.5) patients. This was achieved by selecting those children whose birthday was between the 1st and 12th (inclusive) of any month. Provision was made for inclusion and numerical weighting of data from children whose date of birth was unknown. A total of 15 patients with birth dates outside of the desired sampling frame were also sampled. These children were included in the analyses with appropriate adjustments being made to statistical weights. Records from children with a known date of birth were weighted up, while records from children for whom age only was known or who were not sampled according to the desired sampling frame were weighted down. The sum of the weighted records is equivalent to the number of children sampled for the survey. The number of cases have been rounded to the nearest integer.

The data were extensively cleaned prior to analysis to correct for errors and duplicate cases. In addition, cases with ages more than 3 standard deviations from the mean age for a given number of either deciduous or permanent teeth were examined and corrected where the cause for an error could be determined. These cases most likely represented data recording errors

All indices were calculated from data collected over a 12-month period. Where children received more than one examination during this period the information derived from examinations other than the first has been excluded. However, analyses of children's history of School Dental Service examinations (Tables 10 and 11) use information from all examinations. 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

The great majority of children in the sample (95.7%) were aged between 5 and 12 years inclusive (see Table 1). Twelve-year-olds were one third as likely as those aged between 6 and 11 years to be in the sample, while children aged 4 years or less and those aged 13 years or older were represented in relatively small numbers. Males and females were sampled in approximately equal proportions with only minor variations in proportions across age groups.

This distribution of the sample is closely related to the main target groups of children served by the School Dental Service in the ACT and emphasises that the sample is representative of primary school aged children served by the School Dental Service, rather than all children in the ACT. The small numbers of children aged younger than 5 years or 13 years and older are likely to be less representative of ACT children in general, and their small numbers contribute to imprecision in some age-specific statistics contained in the remaining tables. As a result of the small number of children aged less than 5, these age-groups are not reported on in the following analyses. Children aged 15 and 16 were combined for subsequent analyses.

Changes since 1997

The sampled number of cases decreased by 287 from 1997. The reduction was evident across most age groups, and occurred approximately equally for males and females.

Table 1: Demographic composition of the sample

	Number of children in sample		
Age (years)	**Males**	**Females**	**Persons**
	n	***n***	***n***
3	0	2	2
4	4	2	6
5	207	190	397
6	301	285	586
7	278	287	565
8	253	260	513
9	236	252	488
10	249	231	480
11	204	191	395
12	84	81	165
13	25	41	66
14	29	26	55
15	11	15	26
16	4	4	8
Total	**1,885**	**1,867**	**3,752**

Deciduous teeth: age-specific caries experience

The mean number of clinically detectable decayed (d) teeth among children aged 5 to 12 years ranged from 0.81 for 6-year-olds to 0.23 for 12-year-old children (see Table 2). The reduction in the decay score with age can be explained by the exfoliation of deciduous teeth (as seen by the decrease in the mean number of deciduous teeth in Table 2) and does not necessarily reflect a reduction in the percentage of teeth with decay with increasing age. Across all age groups very few children presented with teeth missing due to caries. The mean number of teeth with fillings increased across age groups, from 0.37 among 5-year-olds to 0.95 among 10-year-olds, before declining. The mean dmft showed a similar trend to that of the mean number of filled teeth, generally increasing to ages 9 and 10, before declining.

The percentage of caries experience due to decay (d / dmft) showed an age-associated decline, more than halving from 67.4% among 5-year-olds to 28.4% among 11-year-olds (see Table 3). By comparison, the percentage of children with no recorded decay experience in the deciduous dentition (% dmft=0) showed a more modest reduction from 66.2% among 5-year-olds to 44.9% among 10-year-olds before increasing to 57.1% for 12-year-olds.

The surface-level caries experience (see Table 4) shows approximately 60–70% higher caries experience (dmf) for 6–11-year-olds than when using tooth-level statistics. There were approximately 50–60% more clinically decayed surfaces across this age range than there were teeth with clinically detectable decay. General trends are similar to those indicated previously for analyses at the tooth level.

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

Age	Children	Teeth	Decayed (d)		Missing (m)		Filled (f)		dmft	
	n	mean	mean	SD	mean	SD	mean	SD	mean	SD
5	397	19.27	0.67	1.42	0.00	0.05*	0.37	1.14	1.04	2.00
6	586	17.34	0.81	1.77	0.01*	0.17*	0.58	1.43	1.40	2.51
7	565	14.47	0.60	1.41	0.01*	0.13*	0.63	1.35	1.24	2.11
8	512	12.31	0.57	1.20	0.01*	0.08*	0.84	1.56	1.41	2.11
9	479	10.82	0.57	1.01	0.02*	0.28*	0.92	1.56	1.51	1.96
10	437	8.83	0.56	1.07	0.00	0.07*	0.95	1.49	1.52	1.91
11	288	6.39	0.29	0.69	–	–	0.74	1.30	1.03	1.61
12	84	5.19	0.23	0.47	–	–	0.65	1.15	0.88	1.26

[†] Previous ACT CDHS 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.

* relative standard error ≥ 40%

Table 3: Deciduous teeth – caries experience indices by age

Age	Teeth	d/dmft		dmft=0	
	mean	*n*	%	*n*	%
5	19.27	134	67.4	397	66.2
6	17.34	227	59.6	586	61.3
7	14.47	224	49.2	565	60.4
8	12.31	236	41.9	512	53.9
9	10.82	257	43.0	479	46.3
10	8.83	241	40.0	437	44.9
11	6.39	128	28.4	288	55.6
12	5.19	36	35.4	84	57.1

Table 4: Deciduous dentition – decayed, missing and filled surfaces by age

Age	Children	Surfaces	Decayed (d)		Missing (m)		Filled (f)		dmfs	
	n	mean	mean	SD	mean	SD	mean	SD	mean	SD
5	397	85.05	0.95	2.23	0.01*	0.20*	0.58	1.95	1.55	3.21
6	586	77.20	1.29	3.67	0.03*	0.66*	0.98	2.56	2.30	4.78
7	565	65.80	0.95	2.53	0.04*	0.66*	1.06	2.48	2.05	3.87
8	512	57.02	0.90	2.04	0.03*	0.38*	1.43	2.86	2.35	3.85
9	479	50.52	0.91	1.73	0.08*	1.41*	1.59	2.77	2.58	3.76
10	437	41.55	0.85	1.72	0.02*	0.34*	1.56	2.52	2.43	3.24
11	288	30.40	0.46	1.25	–	–	1.23	2.29	1.69	2.84
12	84	26.31	0.32	0.76	–	–	0.94	1.77	1.26	1.94

* relative standard error ≥ 40%

Changes since 1997

The mean number of clinically detectable decayed teeth and mean dmft scores were higher in 1998 for almost all age groups than in 1997. Increases in mean dmft were appreciable for children aged 6, 7, 9, 10 and 12. For some ages, d / dmft was lower in 1998 than in 1997, while the percentage of children with dmft=0 was also lower for several age groups in 1998 than in 1997.

Permanent teeth: age-specific caries experience

It can be seen from Table 5 that clinically detectable decay increased relatively consistently across the age range of 6–14 years from a mean of 0.07 to a mean of 0.45. The mean DMFT also increased across age groups, from 0.09 for 6-year-olds to 1.09 for children aged 14 years. To some extent, the age-related increase in D and DMFT scores reflects the increase in permanent teeth with age, from 3.64 for 5-year-olds to 27.31 for children aged 15 years old. However, there is also a significant increase in both clinically detectable decay and DMFT scores in the oldest age groups sampled despite a plateauing of the number of teeth present. The mean DMFT for 12-year-olds was 0.68.

The percentage of DMFT due to decay (D / DMFT) and the percentage of caries free children (DMFT=0) generally declined across age groups (see Table 6).

The surface-level caries experience (DMFS) in the permanent dentition (see Table 7) was higher than the respective mean DMFT scores, ranging from 11% among 6-year-olds to 54% among 13-year-olds. Up to the age of 11 there were approximately 10–20% more clinically decayed surfaces than decayed teeth, with the increase exceeding 20% for the older children.

Changes since 1997

Increases in the mean number of clinically decayed permanent teeth were most evident for children aged 12 years of age and older. There was also an increase across these age groups for D / DMFT in 1998, compared to 1997. Considerable variability can

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

Age	Children	Teeth	Decayed (D)		Missing (M)		Filled (F)		DMFT	
	n	mean	mean	SD	mean	SD	mean	SD	mean	SD
5	120	3.64	0.02*	0.13*	–	–	–	–	0.02*	0.13*
6	475	5.73	0.07	0.36	–	–	0.01*	0.13*	0.09	0.39
7	552	8.69	0.11	0.48	–	–	0.03	0.21	0.14	0.52
8	513	11.19	0.15	0.50	0.01*	0.13*	0.08	0.36	0.24	0.67
9	487	12.98	0.19	0.69	–	–	0.14	0.45	0.33	0.81
10	480	15.93	0.25	0.64	0.01*	0.14*	0.26	0.70	0.53	1.03
11	395	20.17	0.19	0.61	0.01*	0.10*	0.31	0.74	0.51	0.99
12	165	23.30	0.25	0.83	0.02*	0.22*	0.41	1.03	0.68	1.29
13	66	26.38	0.35	0.73	0.06*	0.35*	0.53	0.98	0.94	1.39
14	55	27.47	0.45	1.07	0.04*	0.19*	0.60	1.08	1.09	1.69
≥15	35	27.31	1.06	1.61	–	–	1.26	1.75	2.31	2.72

† Previous ACT CDHS reports have included children with no permanent teeth in the analyses of permanent caries experience, effectively giving these children scores of 0 for decayed, missing and filled teeth. Including children with no permanent teeth in analyses understates the total level of caries experience of children aged up to 7.

* relative standard error ≥ 40%

be seen in DMFT scores between 1997 and 1998, with several age groups showing increases, yet several demonstrating decreases. The percentage of children with DMFT=0 has decreased between 1997 and 1998 for children aged 10, 12, 13 and 15.

Table 6: Permanent dentition – caries experience indices by age

Age	Teeth	D/DMFT		DMFT=0	
	mean	*n*	%	*n*	%
5	3.64	2	100.0	120	98.3
6	5.73	28	84.8	475	94.1
7	8.69	48	70.8	552	91.3
8	11.19	74	65.2	513	85.6
9	12.98	108	54.9	487	77.8
10	15.93	141	50.1	480	70.6
11	20.17	113	37.3	395	71.4
12	23.30	57	39.2	165	65.5
13	26.38	26	35.8	66	60.6
14	27.47	26	33.7	55	52.7
≥15	27.31	23	41.4	35	34.3

* relative standard error ≥ 40%

Table 7: Permanent dentition – decayed, missing and filled surfaces by age

Age	Children	Surfaces	Decayed (D)		Missing (M)		Filled (F)		DMFS	
	n	mean	mean	SD	mean	SD	mean	SD	mean	SD
5	120	16.55	0.02*	0.13*	–	–	–	–	0.02*	0.13*
6	475	26.05	0.08	0.42	–	–	0.02*	0.17*	0.10	.049
7	552	38.47	0.12	0.52	–	–	0.04	0.30	0.16	0.60
8	513	48.83	0.17	0.63	0.04*	0.61*	0.08	0.38	0.30	1.05
9	487	56.70	0.23	1.01	–	–	0.17	0.60	0.40	1.15
10	480	70.22	0.28	0.74	0.06*	0.65*	0.33	0.94	0.66	1.53
11	395	90.15	0.22	0.74	0.05*	0.50*	0.37	0.97	0.65	1.37
12	165	104.24	0.35	1.53	0.12*	1.10*	0.53	1.50	1.00	2.33
13	66	117.98	0.42	0.96	0.30*	1.73*	0.73	1.44	1.45	2.44
14	55	125.29	0.58	1.52	0.18*	0.94*	0.71	1.29	1.47	2.42
≥15	35	124.80	1.23	1.96	–	–	1.40	2.13	2.63	3.10

* relative standard error ≥ 40%

All teeth: age-specific caries experience

Untreated caries in the combined deciduous and permanent dentitions (d+D≥1) existed for between 39.6% and 23.6% of children in the age range 5 to 14 years (see Table 8). The greatest likelihood of detectable untreated decay was seen for 10-year-olds. However, the most extensive levels of untreated decay (d+D=4 or more) occurred in the younger age groups with the percentage d+D≥4 generally declining with increasing age.

More than 96% of children in any age group had no deciduous or permanent teeth missing due to caries, with little variation across age categories. However, smaller percentages avoided fillings. The percentage of children without fillings declined to age 10, increased to age 13, and then declined again. There was a similar pattern in the percentage of children with no caries experience in either deciduous or permanent dentition (dmft+DMFT=0), declining from 66.0% at age 5 to 38.1% at age 10, increasing to 56.1% at age 13, and then declining.

Changes since 1997

There was a decrease between 1997 and 1998 in the percentage of children with d+D=0 with the exception of children aged between 12 and 14, where there was an increase. There were also changes in the percentages f+F=0, with decreases for several age groups and an increase for 13-year-olds. Between 1997 and 1998 there was an increase in percentage d+D=1 for 10–12-year-olds and a decrease for 13–14-year-olds. There was an increase in percentage d+D=2 for children aged 6, 9, 10 and 13, and a decrease for 12- and 14-year-olds. Overall, the percentage of children with dmft+DMFT=0 reduced for several age groups including children aged 5, 6, 9 and 10.

Table 8: All teeth – age-specific caries experience

		d + D =								
Age	Children	0	1	2	3	4	5+	m+M=0	f+F=0	dmft+ DMFT=0
	n	%	%	%	%	%	%	%	%	%
5	397	73.0	9.8	7.6	3.3	2.8	3.5	99.7	85.1	66.0
6	586	67.9	11.8	8.4	4.1	3.8	4.1	99.8	78.0	59.6
7	565	71.0	11.7	8.0	3.5	2.8	3.0	99.6	72.6	57.5
8	513	67.4	14.2	9.0	4.7	1.9	2.7	98.8	64.7	48.7
9	488	62.1	18.2	11.7	4.1	1.4	2.5	99.4	57.4	38.9
10	480	60.4	21.9	9.2	4.0	1.9	2.7	98.8	54.6	38.1
11	395	75.4	15.4	4.6	3.0	1.0	0.5*	99.0	61.5	52.2
12	165	75.8	18.8	3.0	0.6*	0.0	1.8*	98.8	67.9	51.5
13	66	75.8	12.1	10.6	1.5*	0.0	0.0	97.0	69.7	56.1
14	55	76.4	12.7	3.6*	3.6*	1.8*	1.8*	96.4	63.6	50.9
≥15	35	57.1	20.0	0.0	11.4	8.6*	2.9*	100.0	42.9	31.4

* relative standard error ≥ 40%

Fissure sealants: age-specific experience

The mean number of fissure sealants generally increased in prevalence with increasing age (see Table 9). There is clear evidence of preferential use of fissure sealants among those with caries experience: the prevalence of fissure sealants among children with some caries experience (DMFT=1+) was between 24.8% and 214.2% greater than among those with no caries experience (DMFT=0). Percentage differences ranged between 50% and 70% for children aged between 10 and 14.

Changes since 1997

There were no consistent changes in the mean number of fissure sealants across years, with increases for children aged 6–9, 12 and 15, and decreases for children aged 11, 13 and 14. The percentage of caries-free children with a fissure sealant showed a decrease across a number of age categories while the percentages of children with DMFT≥1 who have a fissure sealant increased for some age groups, creating a greater difference between these groups in the percentage of fissure sealants placed than was evident in 1997; there was little difference across caries status groups in 1997 in the percentage of children aged 11+ with sealants.

Table 9: Fissure sealants – age-specific experience

Age	Children	Sealants		Students with sealants			
				DMFT=0		DMFT≥1	
	n	mean	SD	*n*	%	*n*	%
6	586	0.13	0.66	558	3.9	28	10.7
7	565	0.36	1.03	517	10.6	48	33.3
8	513	0.78	1.42	439	25.1	74	33.8
9	488	1.00	1.53	380	32.6	108	40.7
10	480	1.06	1.51	339	32.2	141	54.6
11	395	1.07	1.54	282	34.0	113	52.2
12	165	1.28	1.78	108	38.9	57	59.6
13	66	1.21	1.65	40	37.5	26	57.7
14	55	1.27	2.08	29	34.5	26	53.8
≥15	35	1.51	2.50	12	33.3	23	47.8

School Dental Service examinations

Table 10 describes the percentage of examinations in 1998 recorded as the first examination for a child in the ACT School Dental Service. As expected, the figure is highest for the youngest ages (6 years or less) with few children aged 8 years or more having had no previous examination. This pattern is expected and indicates that most patients are enrolled during their early school years.

Table 11 includes only children with previous examinations and indicates their distribution according to time since last dental examination. Approximately 45–70% of examinations of children aged up to 12 in 1998 occurred within 12 months of their previous examination, with 20–40% occurring 13 to 24 months previously. A minority of examinations occurred more than 2 years since the previous examination. Time since last examination increased fairly consistently across most age groups: whereas 65.4% of 5-year-olds had an examination within the previous year this figure was only 34.6% for 13-year-olds. This can also be seen from the mean time since last visit, which increased from 9.46 months for 5-year-olds to 16.86 months for 14-year-olds.

Table 10: School Dental Service examinations – age-specific distribution

Age	Examinations	Previous examination in School Dental Service		
		No	Yes	Unknown
	n	%	%	%
5	419	37.2	35.1	27.7
6	629	21.6	58.8	19.6
7	605	9.3	70.9	19.8
8	555	5.0	79.1	15.9
9	527	3.4	82.5	14.0
10	506	2.8	83.4	13.8
11	417	0.7*	85.6	13.7
12	180	2.8	85.0	12.2
13	68	4.4*	76.5	19.1
14	55	7.3	52.7	40.0
≥15	35	0.0	71.4	28.6

* relative standard error ≥ 40%

Table 11: School Dental Service examinations – time since last visit

Age	Children	Months since last visit						
		0–6	7–12	13–18	19–24	25+	mean	SD
	n	%	%	%	%	%		
5	147	36.1	36.7	20.4	6.1	0.7*	9.46	5.55
6	370	27.8	37.6	25.7	5.4	3.5	10.64	5.91
7	427	23.9	33.7	27.4	10.3	4.7	11.99	6.71
8	437	22.4	33.0	27.7	9.4	7.6	12.65	7.41
9	434	20.7	30.2	25.1	11.3	12.7	14.12	8.59
10	420	18.3	31.0	26.4	10.0	14.3	14.32	8.47
11	357	16.2	34.5	25.2	10.1	14.0	14.72	9.22
12	152	15.1	31.6	25.7	13.8	13.8	15.42	9.26
13	52	1.9*	32.7	32.7	11.5	21.2	16.56	7.98
14	28	3.6*	25.0	42.9	14.3	14.3	16.86	6.86*
≥15	25	4.0*	16.0	40.0	20.0	20.0	18.24	7.11*

* relative standard error ≥ 40%

Time since last examination for both 6- and 12-year-olds is presented in Figure 1.

Changes since 1997

For children who had had a previous examination there was an appreciable increase in the percentage of all children up to the age of 12 who had their last examination between 0 and 6 months previously. There was a corresponding reduction in the percentage of children with their last visit between 7 and 12 months previously for 5–9-year-olds and between 13 and 18 months previously for all ages up to and including 13. Increases occurred for some age groups in the percentage of children with last examinations greater than 2 years previously. Since 1997 there was a decrease for children aged 13 years or older in the percentage who had previously had an examination with the School Dental Service.

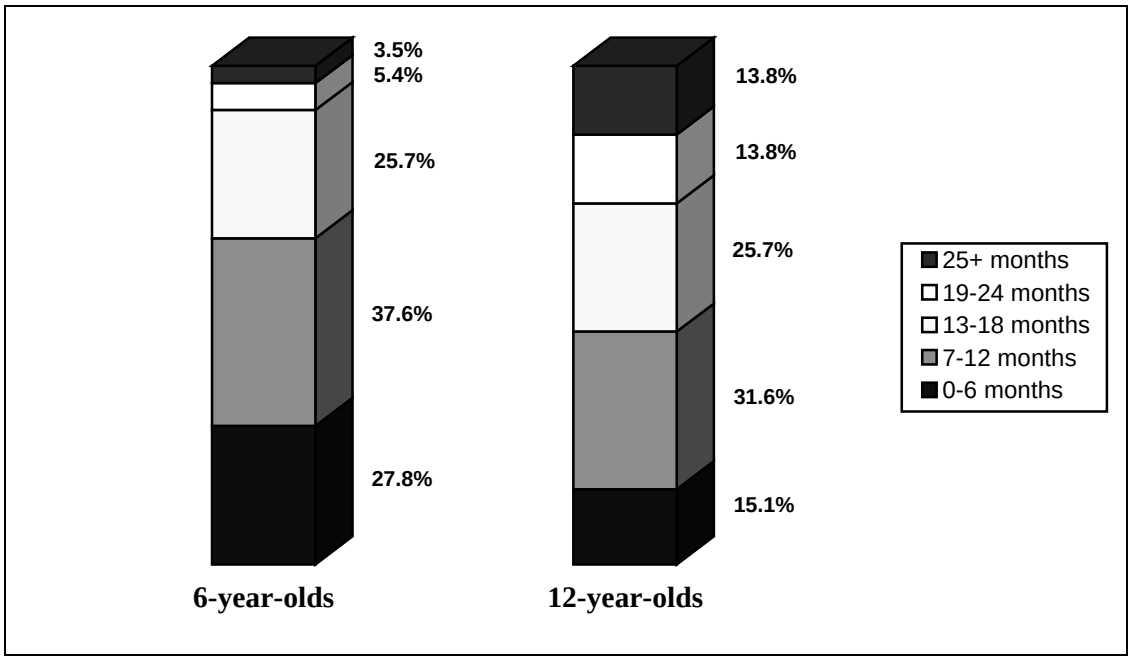

Figure 1: Time since last dental examination for 6- and 12-year-olds

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

Figure 2 uses data from previous tables to describe the percentages of children with no detectable caries experience in the deciduous dentition (dmft=0), no detectable caries experience in the permanent dentition (DMFT=0) and with clinically detectable decay in 4 or more teeth in either the deciduous or permanent dentition (d+D≥4). Trends across age groups should be interpreted in light of the exfoliation and eruption with age of deciduous and permanent teeth respectively.

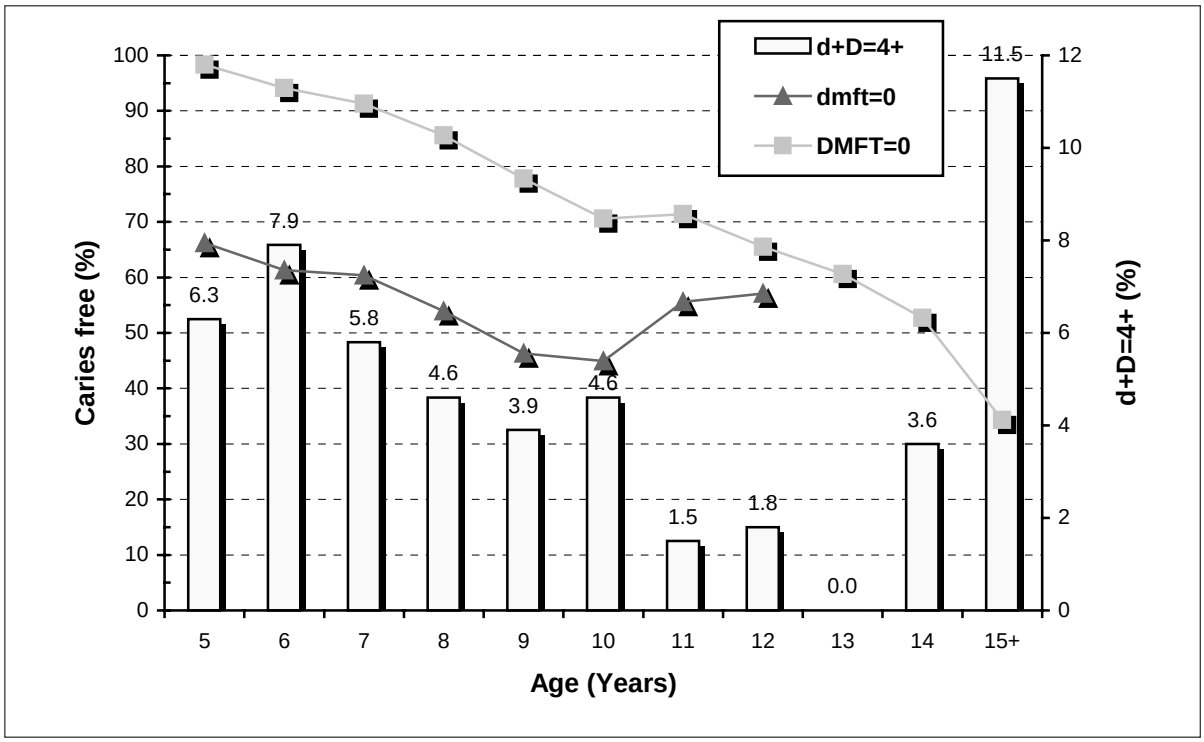

Figure 2: Percentage of children with dmft=0, DMFT=0 and d+D≥4