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The Child Dental Health Survey, Queensland 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 is part of the annual series providing descriptive statistics concerning child dental health in Queensland. The tables and figures contained in this report describe the demographic composition of the sample, deciduous and permanent caries experience, extent of immediate treatment needs, prevalence of fissure sealants and other relevant information. The report also presents a description of the Survey methods.

The report provides summary statements highlighting differences between the 1999 and 2000 findings. However, it should be noted that no formal hypothesis tests have been undertaken and descriptions of differences between years are intended as a guide to the reader rather than a formal evaluation of trends.

Background to the Child Dental Health Survey

The Child Dental Health Survey, originally established in 1977 by the (then) Commonwealth Department of Health, is intended to provide time-series data for the purpose of monitoring the dental health status of primary school children. The establishment of the Survey coincided with the development of the Australian School Dental Scheme (ASDS), a government-funded program providing dental care for school children. Implicit within the original goals of the Child Dental Health Survey was the collection of routine data from all patients of the ASDS, which was to be administered through each of the State and Territory health authorities. There was no attempt to obtain information about those children not enrolled in the ASDS. From the inception of the Survey, School Dental Service staff has collected data.

The survey has been maintained annually since 1977. Following some changes to the survey procedures by individual State and Territory health authorities (principally in the methods of sampling, but also including some alterations to data items) a redesigned Survey was developed in 1988. At that time responsibility for the management and processing of the Survey was passed to the Dental Statistics and Research Unit (DSRU), an external unit of the Australian Institute of Health and Welfare. In the process of transferring responsibility for the Survey, State and Territory health authorities were encouraged to adopt some limited changes to the types of data collected and to move towards sampling of a proportion of children. By the end of 1991, those changes were adopted uniformly.

Survey methods

Data for the Child Dental Health Survey were collected during the 2000 calendar year from a sample of patients of the Queensland School Dental Service by dental therapists and dentists. Data items were transcribed from routine clinical records on to Optical Mark Reader (OMR) data sheets.

The AIHW Dental Statistics and Research Unit performed processing and editing of all data forms. Unit record data were forwarded to the DSRU in Adelaide for processing and analysis.

Source of subjects and sampling

It was intended that children throughout Queensland would be sampled at a ratio of approximately 1:15 by selecting those whose date of birth was on either the first or the sixth day of any month. All children with an unknown date of birth were also sampled. Sampling occurred at the time of routine clinical examinations prior to the commencement of any course of care.

The outcome of sampling varied across Queensland Health Service Districts (HSDs) and within these sometimes varied by clinics. HSDs are here grouped according to Health Zones, as shown in Figure 1. The number of children sampled in each district and the sampling procedure predominantly used are given in Table 1. While most HSDs utilised the intended sampling procedure, the large number of children sampled from the Gold Coast HSD derived from a full enumeration of 6- and 12-year-olds in this district. Table 1 also provides information on the Estimated Residential Population (ERP) of Queensland HSDs and the percentage of the HSDs actually sampled. Percentages ranged from 0% in a number of HSDs to 8.8% in the Gold Coast.

The bulk of the children came from the Brisbane North, Bayside, Gold Coast Logan/Beaudesert, Mackay, QEII, Sunshine Coast and Townsville HSDs (77.8%). There were few children sampled from Bundaberg, Central Highland, Charleville, Charters Towers, Fraser Coast, Redcliffe/Caboolture, Roma, South Burnett and Torres Strait HSDs. Some districts failed to sample any children (Cape York, Central West and North Burnett).

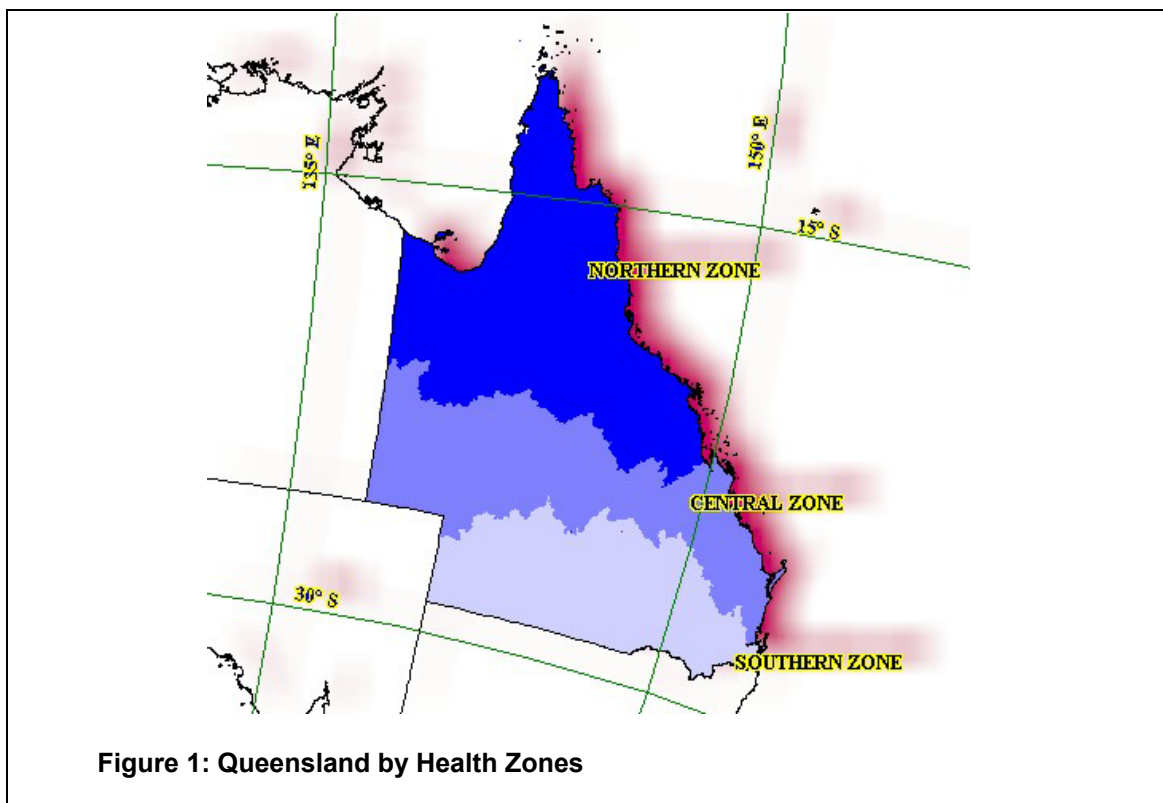


Table 1: Number of children sampled and Estimated Resident Population (ERP) by Health Zone and District

Health Services District	<i>n</i>	Most common sampling ratio	ERP	Per cent of ERP sampled
Northern Zone				
Bowen	111	1 : 15	4,660	2.4
Cairns	162	1 : 15	18,784	0.9
Cape York	0		1,689	0.0
Charters Towers	48	1 : 15	2,536	1.9
Innisfail	184	1 : 15	4,902	3.8
Mackay	561	1 : 15	17,027	3.3
Moranbah	103	1 : 15	3,578	2.9
Mount Isa	134	1 : 15	5,452	2.5
Tablelands	68	1 : 15	6,636	1.0
Torres Strait	2	1 : 15	2,246	0.1
Townsville	908	1 : 15	23,491	3.9
Central Zone				
Banana	37	1 : 15	2,623	1.4
Brisbane North	1,193	1 : 15	64,185	1.9
Bundaberg	3	1 : 15	10,883	0.0
Central Highland	19	1 : 15	4,868	0.4
Central West	0		1,821	0.0
Fraser Coast	6	1 : 15	11,581	0.1
Gladstone	63	1 : 15	6,940	0.9
Gympie	238	1 : 15	5,190	4.6
North Burnett	0		1,449	0.0
Redcliffe/Caboolture	27	1 : 15	26,230	0.1
Rockhampton	140	1 : 15	14,641	1.0
South Burnett	18	1 : 15	4,908	0.4
Sunshine Coast	572	1 : 15	35,025	1.6
Southern Zone				
Bayside	526	1 : 15	25,990	2.0
Charleville	28	1 : 15	1,383	2.0
Gold Coast*	3,744	1 : 1	42,746	8.8
Logan/Beaudesert	521	1 : 15	46,473	1.1
Northern Downs	85	1 : 15	4,743	1.8
QEII	1,275	1 : 15	53,935	2.4
Roma	26	1 : 15	2,652	1.0
Southern Downs	262	1 : 15	8,666	3.0
Toowoomba	393	1 : 15	20,438	1.9
West Moreton	289	1 : 15	26,404	1.1
Unknown	204		0	

* 6- and 12-year-old children only sampled at 1:1

Note: ERP obtained from ABS, Population by age and sex, Queensland, 30 June 2000.

Changes since 1999

Compared to 1999 there were decreased numbers of children sampled for most of the HSDs, with increases for only 11 of the 33 HSDs. The biggest reductions (decreases > 50%) occurred for Central Highland, Fraser Coast, Redcliffe/Caboolture and Charleville). The percentage change in the number of children sampled in each HSD between 1999 and 2000 is shown in Figure 2.

Data items

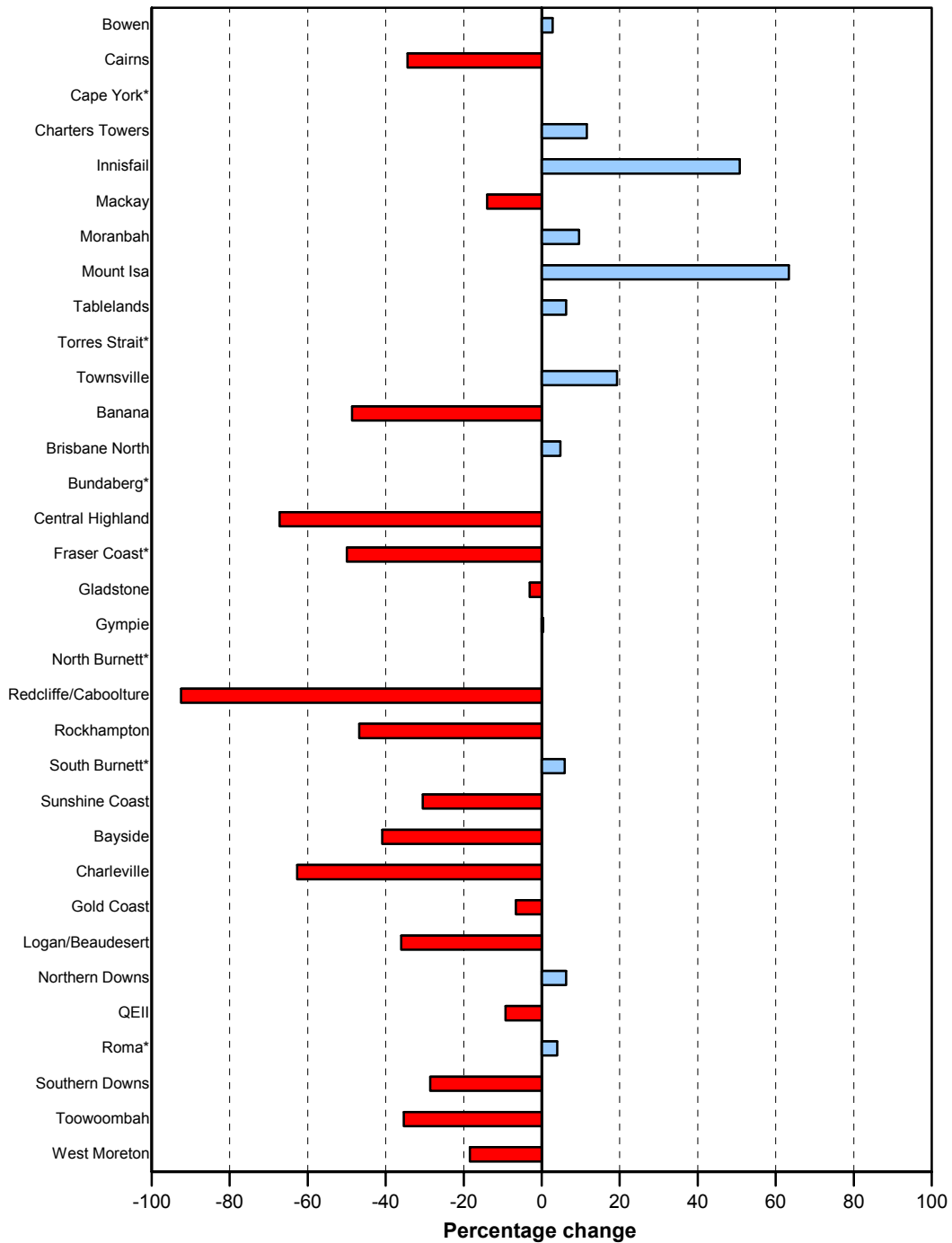
Demographic and service provision data items include the child's age, sex and the date of the current and previous examination. Provision was made for recording country of birth and the indigenous status of each child and mother.

Dental health status data items include a count of the number of teeth that were decayed, missing (because of dental caries) or filled (because of dental caries). Separate counts of caries experience were made of deciduous and permanent teeth. A count of the number of permanent teeth with fissure sealants (and which were not decayed or filled) was also made. An additional data item was marked to indicate if the child had a need for immediate treatment, defined as the presence of oral pain or infection, or the likely occurrence of oral pain or infection within four weeks. This would include children requiring treatment for existing pain, dental abscesses, grossly decayed teeth with pulp exposure, avulsed or fractured teeth, or life threatening conditions. All indices follow recommendations made by the World Health Organization (1987) and by Palmer et al. (1984) concerning epidemiological recording of dental conditions. A survey guide was previously issued to all clinics explaining the conventions for data recording. However, there were no formal procedures for training or calibration in the clinical procedures for detection of caries experience. Instead, clinical staff used their own clinical judgement when making decisions about the presence or absence of decayed, missing, filled or fissure sealed teeth.

Data preparation

Prior to OMR scanning a check was made for missing or erroneous data. Where tooth level information was incorrect (e.g. a tooth indicated as both fissure sealed and unerupted), or where required fields were missing, the OMR form was returned to the relevant clinic for correction.

Data were cleaned prior to analysis after a visual check identified a number of cases with erroneous results. In addition, linear regression of age on the number of deciduous and permanent decayed, missing or filled teeth revealed a number of outliers with standardised residuals greater than 3 standard deviations from the mean. A visual check allowed a number of these cases to be corrected where it was evidently a data recording error (e.g. transposition of deciduous and permanent teeth). A small number of cases that could not be reconciled and were clearly erroneous were deleted from the dataset.



* Health Zone District had no or very few children sampled in 1999.

Figure 2: Percentage change in number of children sampled between 1999 and 2000 by Health Service District

Analyses

Data were analysed to provide age-specific means and percentages for each dental disease index and for periodicity of examinations. Standard deviations were computed for all means. The level of statistical precision for all age-specific estimates was assessed by computing the relative standard error (that is, standard error of the estimate divided by the estimate, expressed as a percentage). Estimates with relative standard errors exceeding 40% are marked with an asterisk. These estimates are statistically unreliable and should be interpreted with caution.

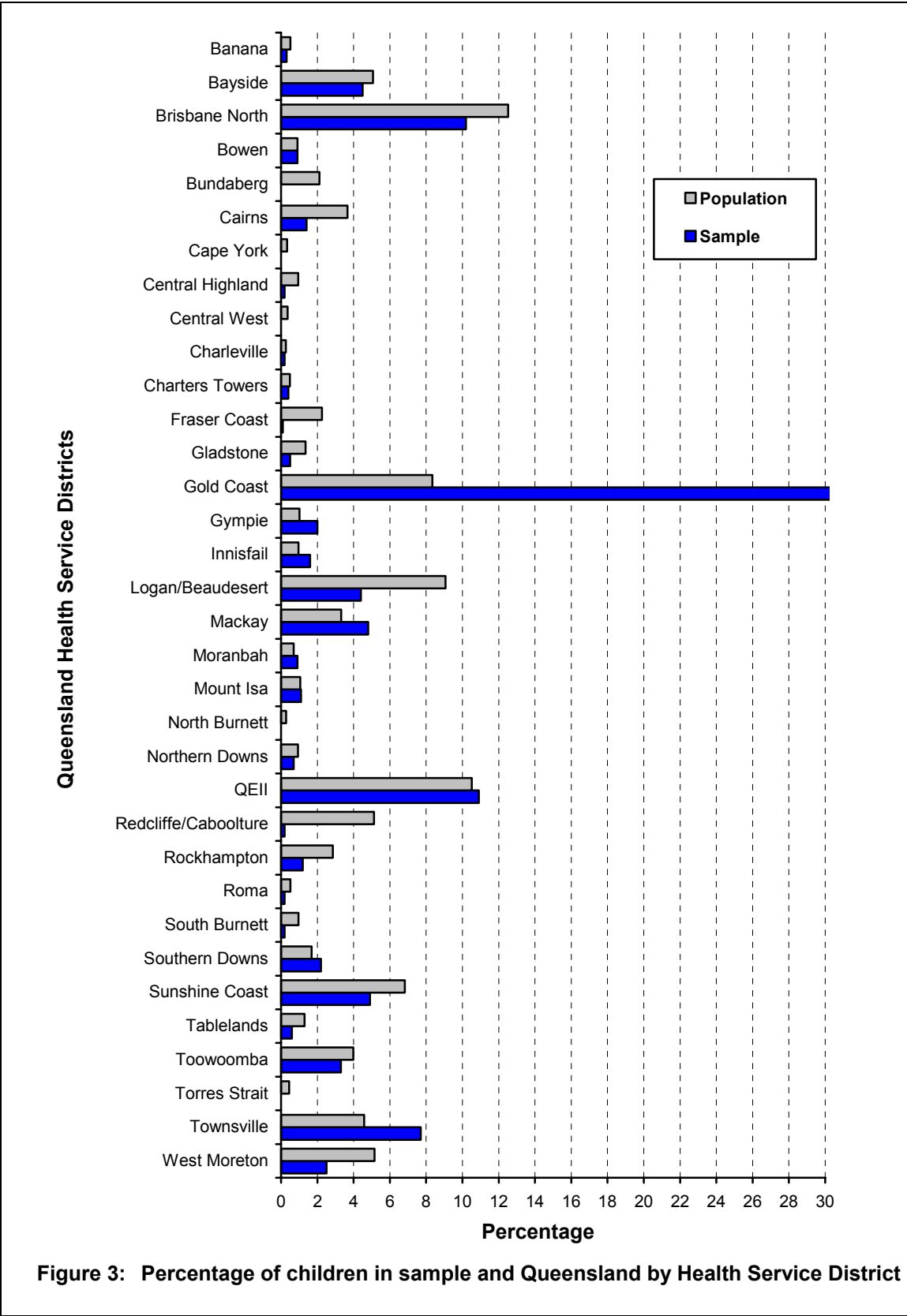
A further aspect of the analysis was the weighting of unit records to reflect the sampling procedure. This was necessary because children were sampled using different probabilities of selection. The probability was 1.0 (i.e., selected by full enumeration) for children with an unknown date of birth throughout the State and for some children from the Gold Coast HSD. Elsewhere the probability was approximately 0.066 (*ie* equivalent to the ratio of 1:15) for students sampled according to the intended procedure. Hence, the weighting process considered the number of students sampled (n_i) and the number of children in the population (assuming accurate sampling, $N_i=n_i/[\text{sampling probability}]$) for each sampling strata. Stratum specific weights, w_i , which could be applied to unit record data, were computed to avoid inflating the sample size. The following formula was used:

$$w_i = \frac{N_i / n_i}{\sum N_i / \sum n_i}$$

Data were further weighted to reflect the Estimated Residential Population (ERP) of 5–14-year-olds in each Health Service Division (HSD) in Queensland. District estimates were computed using ERP as at 30 June 2000 by Statistical Local Areas, as published by the Australian Bureau of Statistics (2000), where were mapped to HSDs. The relative sample sizes and population estimates by HSD as a percentage of the total sample and Queensland population are shown in Figure 3.

Data were also weighted by time since last school dental service examination where this information was available. This was necessary because children on a short recall period have a higher probability of being sampled than children on a longer recall period.

The purpose of the weighting protocol was to produce estimates that are representative of the population covered by the School Dental Service for 2000. However, the estimates in this report cannot be applied to children who are not enrolled in the Queensland School Dental Service. Consequently, the results in this report do not represent the complete Queensland child population, but only that portion of the population that is enrolled in the Queensland School Dental Service. In Queensland, approximately 80% and 50% of 5–12-year-olds and 13–15-year-olds respectively are enrolled in the School Dental Service. Hence, estimates for Primary School aged children in this report may not differ substantially from estimates that would be obtained if all children in the State were surveyed, however estimates for Secondary School children may vary from those obtained if all the children in the State were surveyed.



The final unit record weights were applied to all statistics computed for Tables 2 to 9 such that the weighted contribution of each HSD was proportional to the percentage represented by each HSD of the relevant Queensland population. However, analyses of examination periodicity (Tables 10 and 11) excluded time since last visit in the calculation of the weightings.

Cases from HSDs with very few children sampled were retained in the data set but not weighted by region (i.e. given a weight of 1) because the application of weights was deemed likely to significantly influence the results. As a result, cases from Banana, Bundaberg, Central Highland, Charleville, Fraser Coast, Redcliffe/Caboolture, Roma, South Burnett and Torres Strait HSDs were not weighted by region, but remained in the data set.

Demographic composition of the sample

A total number of 11,950 individual children were sampled during 2000 (see Table 2). The majority of children in the complete sample were aged between 5 and 15 years inclusive (97.5%). There were very small numbers of children aged less than 4 or greater than 15 years. In the weighted distribution, males and females were represented in approximately equal numbers. There was little difference between the average age of males (mean = 9.01) and that of females (mean = 8.88).

Table 2: Demographic composition of the sample

Age (years)	Known date of birth			Age only known			Weighted no. of children		
	Males	Females	Persons	Males	Females	Persons	Males	Females	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>	<i>n</i>
2	4	2	6	0	0	0	5	3	9
3	7	7	14	0	0	0	10	8	18
4	108	128	236	0	1	1	115	132	246
5	383	443	827	5	3	8	421	508	929
6	931	908	1,839	465	455	920	670	635	1,305
7	534	572	1,106	2	10	12	688	756	1,445
8	517	463	980	7	3	10	668	624	1,292
9	418	494	912	8	11	19	542	693	1,235
10	185	435	920	5	6	11	668	606	1,274
11	420	460	880	1	8	9	590	670	1,260
12	704	675	1,379	322	308	630	533	519	1,052
13	263	248	511	0	2	2	409	349	758
14	220	187	407	1	2	3	332	286	619
15	146	121	267	1	0	1	251	195	445
16	11	13	24	0	1	1	17	28	45
17	3	7	10	0	0	0	3	10	13
18	3	2	5	0	0	0	4	2	6
Total	5,157	5,165	10,323	817	810	1,627	5,926	6,023	11,950

The age distribution of the sample reflects the age range of school children who are the principal target group of the Queensland School Dental Service. The small numbers of children aged 4 years or less and 15 years or more results in less reliability of computed statistics for those ages. Furthermore, children in those ages are outside the main target group of the School Dental Service and it is likely that they have some special characteristics that make them less representative of their respective age groups within the Queensland population.

Changes since 1999

The total number of children sampled in 2000 was 2,239 cases fewer than for 1999. This considerable reduction occurred for almost every age group and was caused by reduced numbers of children sampled from a majority of the HSDs.

Country of birth and Indigenous status

The birthplace/Indigenous status of 76.9% of children was missing or recorded as not known. Australian-born (non-Indigenous) children represented 95.1% of the remainder of the sample (22.2% of the total sample). Children identified as Australian-born Indigenous comprised 0.5% of the total sample and 2.3% of the known valid sample. Only small numbers of children were identified as being born outside of Australia. Due to the small amount of known information concerning the birthplace/Indigenous status of the children's mothers these results are omitted from this report.

Changes since 1999

There have been few changes in the percentages of children sampled by country of birth between 1999 and 2000 and Indigenous status continues to be poorly recorded.

Deciduous teeth

Table 3 shows that the mean number of clinically decayed teeth among children aged up to 12 years old declined consistently across age groups, from 1.30 for children aged 5 years of age to 0.15 for 12-year-old children. In contrast, the mean number of filled teeth increased with age, peaking at 1.54 for 8-year-olds before declining to 0.36 for 12-year-olds. Mean dmft scores increased from 1.69 for children aged up to and including 4 years to 2.57 for 7-year-olds before declining to 0.51 for 12-year-olds.

The ratio of untreated decayed teeth to the total count of decayed, missing, and filled teeth serves as an indicator of how well a child's dental needs are being met. This is presented in Table 4 as the mean of individual children's d/dmft index. Among children with caries experience, the percentage of dmft accounted for by the decayed component declined steadily across age groups, from 81.1% for children aged up to and including 4 years of age to 27.4% for 10-year-olds. Between the ages of 5 and 10 the percentage of children free of clinical caries (dmft = 0) ranged from a high of 53.0% among children aged 5 years to a low of 42.3% among 7-year-olds.

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	273	1.26	2.50	0.03*	0.19*	0.40	1.35	1.69	3.07
5	929	1.30	2.36	0.11	0.88	0.60	1.63	2.00	3.22
6	1,305	1.24	2.12	0.09	0.52	1.06	1.94	2.39	3.21
7	1,445	1.04	1.71	0.10	0.51	1.43	2.11	2.57	3.11
8	1,292	0.80	1.40	0.10	0.54	1.54	2.24	2.45	3.11
9	1,235	0.64	1.20	0.10	0.78	1.47	2.10	2.21	2.80
10	1,274	0.43	0.92	0.05	0.39	1.21	1.82	1.69	2.29
11	1,260	0.32	0.86	0.03	0.41	0.68	1.42	1.04	2.03
12	1,052	0.15	0.50	0.01*	0.13*	0.36	1.03	0.51	1.36

* relative standard error ≥ 40%

Table 4: Deciduous dentition – caries experience indices by age

Age	Mean d/dmft index		dmft = 0	
	<i>n</i>	%	<i>n</i>	%
≤4	111	81.1	273	59.3
5	437	70.6	929	53.0
6	701	54.9	1,305	46.2
7	834	43.0	1,445	42.3
8	705	37.3	1,292	45.4
9	701	32.3	1,235	43.2
10	634	27.4	1,274	50.2
11	428	31.8	1,260	66.1
12	216	30.3	1,052	79.5

The ratio of untreated decayed teeth to the total count of decayed, missing, and filled teeth can also be expressed as the ratio of total decay in the population to total decayed, missing or filled teeth in the population (d/dmft ratio), and this is presented in Figure 4. Unlike the d/dmft index, the d/dmft ratio refers to the proportion of teeth with caries in the population. Thus, the ratio for 6-year-olds indicates that, among 100 teeth with caries experience among 6-year-olds, 51.9% had untreated decay. The d/dmft ratio shows a similar pattern to that of the mean dmft index, with the percentage d/dmft reducing across increasingly older age groups, declining from 74.6% for the youngest children to 25.4% among 10-year-olds. The percentage of dmft accounted for by filled teeth shows the opposite trend, increasing from 23.7% for children aged up to including 4 years old to 71.6 for 10-year-olds.

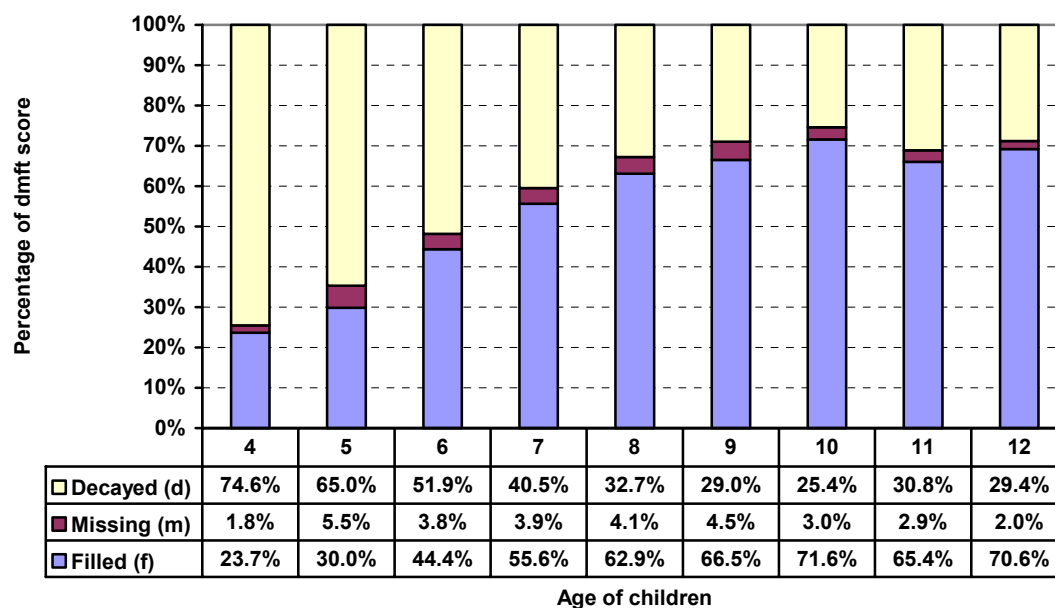


Figure 4: Percentage of dmft score represented by decayed, missing and filled components

Changes since 1999

There were changes in the mean number of caries experience between 1999 and 2000, with decreases observed for most age groups. The mean number of teeth with deciduous decay decreased for 6 of the 9 age groups with percentage reductions ranging from 1.2% for 8-year-olds to 14.5% and 34.0% for 5-year-olds and the youngest children respectively. The mean number of filled teeth also decreased for 6 of the 9 age groups examined, and within the 5–10-year-old age group decreases were experienced by children aged 5, 8 and 9 (4.8%, 6.1% and 5.2% respectively). Reasonably large increases were seen for children aged 6 and 7 (12.8% and 5.2% respectively). Decreases in mean dmft between 1999 and 2000 were evident for all age groups except 6- and 7-year-olds. Between the age range 5–10, 5-year-olds experienced the largest decrease, 11.1% from 2.25 to 2.00. The percentage of children with dmft = 0 was higher for most of the age groups in 2000, compared to 1999, with reductions evident for 6- and 7-year-olds only.

Permanent teeth

The mean number of clinically detectable decayed teeth increased with increasing age (see Table 5), ranging from 0.01 among 5-year-old children up to 0.70 for children aged 15 years old. Similarly, across the same age range, the mean number of teeth with fillings increased with age, ranging from 0.00 to 1.31. DMFT scores increased from 0.03 among 5-year-olds to 2.40 for the oldest age group. The mean DMFT score for 12-year-olds was 1.17. Among children aged 10 to 15 years, the age-associated increase in mean DMFT was greater than the pattern observed for the younger half of the age range. This suggests either that caries activity accelerates after the age of 10, or that these older children represent a cohort with a higher historical caries experience. However, this trend is also affected by the increasing number of permanent teeth at risk, and increasing years at risk, which occur with increasing age.

The percentage of children free of clinically detectable caries in the permanent dentition (DMFT = 0) declined with increasing age of the children (Table 6). It is noteworthy that for age groups up to 12 years, more than 50% of children in any age group were free of clinical caries in the permanent dentition (DMFT = 0). The percentage of DMFT present as untreated clinically detectable decay (mean D/DMFT index) decreased from 81.7% for 6-year-olds to a low of 29.3% for 15-year-olds.

The D/DMFT ratio, which refers to the proportion of teeth with caries experience having untreated decay, showed a similar trend to the D/DMFT index, declining from 76.9% for 6-year-olds to 33.5% for 15-year-olds (Figure 5). Both the D/DMFT and F/DMFT ratios stayed relatively constant between the ages of 10 and 15.

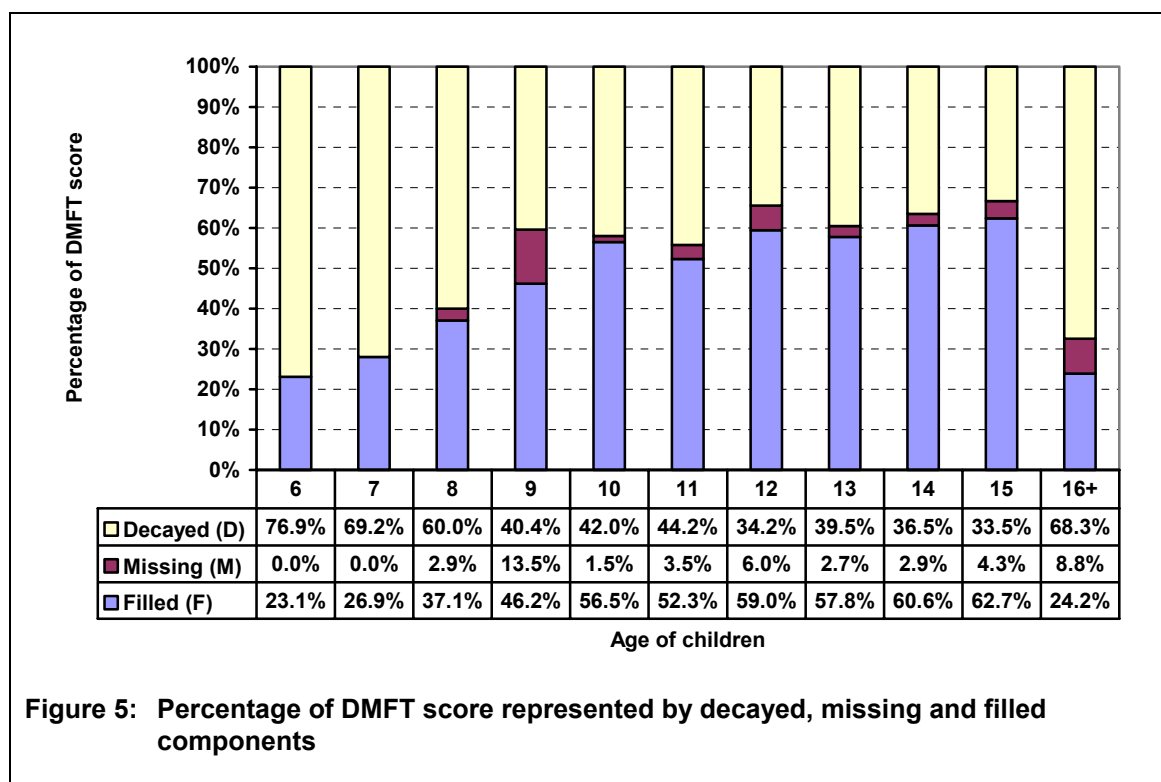
Table 5: Permanent dentition – decayed, missing and filled teeth by age

Age	Children <i>n</i>	Decayed (D)		Missing (M)		Filled (F)		DMFT	
		mean	SD	mean	SD	mean	SD	mean	SD
5	929	0.01	0.15	0.01*	0.12*	0.00	0.06*	0.03	0.22
6	1,305	0.10	0.45	0.00	0.07*	0.03	0.26	0.13	0.59
7	1,445	0.18	0.58	0.00	0.07*	0.07	0.39	0.26	0.73
8	1,292	0.21	0.58	0.01*	0.21*	0.13	0.48	0.35	0.79
9	1,235	0.21	0.61	0.07	0.95	0.24	0.70	0.52	1.36
10	1,274	0.29	0.78	0.01*	0.12*	0.39	0.95	0.69	1.26
11	1,260	0.38	1.01	0.03	0.30	0.45	1.03	0.86	1.54
12	1,052	0.40	0.93	0.07	0.69	0.69	1.35	1.17	1.86
13	758	0.58	1.28	0.04	0.30	0.85	1.42	1.47	2.16
14	619	0.62	1.41	0.05	0.34	1.03	1.61	1.70	2.41
15	445	0.70	1.56	0.09	0.46	1.31	1.85	2.09	2.83
≥16	64	1.64	3.24	0.21*	0.90*	0.58	0.98	2.40	3.17

* relative standard error ≥ 40%

Table 6: Permanent dentition – caries experience indices by age

Age	Mean D/DMFT index		DMFT = 0	
	<i>n</i>	%	<i>n</i>	%
5	17	54.5	929	98.2
6	93	81.7	1,305	92.9
7	212	75.9	1,445	85.3
8	266	63.4	1,292	79.4
9	314	48.4	1,235	74.6
10	400	45.6	1,274	68.6
11	461	47.7	1,260	63.4
12	461	36.7	1,052	56.1
13	377	37.7	758	50.2
14	355	34.1	619	42.6
15	252	29.3	445	43.5
≥16	40	44.4	64	36.8



Changes since 1999

There were generally decreases, some large, in caries experience between 1999 and 2000 for children aged between 8 and 15 years. The biggest reduction in permanent decay occurred for 12- and 13-year-olds, 25.9% from 0.54 to 0.40 and 18.3% from 0.71 to 0.58 respectively. Similarly, there were declines in the mean number of filled teeth for all age groups, except for children aged 7, 10 and 12 who experienced only small increases. Children aged 11 and 13 had reductions of 21.1% and 15.8% respectively in the mean number of filled teeth. As a result of general declines in decayed, missing and filled permanent teeth, the DMFT index showed declines for all but one age group, with reductions ranging from 2.8% for 10-year-olds to 17.9% (1.79 to 1.47) for 13-year-olds. As a result of these changes, decreases in the percentage of DMFT expressed as decay occurred for the majority of age groups. There were consistent changes in the percentages of children with DMFT = 0, with increases for all children other than those aged 7, 8 and 16+.

All teeth

Untreated clinical decay in the combined deciduous and permanent dentitions ($d+D \geq 1$) existed for between 25.6% and 45.1% of children (see Table 7). The greatest likelihood of untreated decay occurred for children aged 7 with 45.1% having $d+D$ of 1 or more. The most extensive levels of untreated clinical decay occurred in the youngest children with the percentage of children with $d+D = 5+$ generally decreasing with increasing age of the children.

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	273	61.2	13.8	6.7	3.7	6.7	8.0	98.1	86.9	57.7
5	929	60.3	13.0	8.8	5.0	2.8	10.1	96.4	82.0	52.6
6	1,305	56.6	14.6	9.3	4.9	4.2	10.5	95.4	67.0	44.1
7	1,443	54.9	16.1	10.1	7.2	4.3	7.4	93.6	55.1	39.2
8	1,292	56.6	18.5	11.5	5.2	2.9	5.3	93.9	54.5	39.6
9	1,235	61.0	17.2	10.8	5.7	2.3	3.0	95.6	48.7	36.5
10	1,274	63.2	19.2	8.3	4.6	2.3	2.3	97.0	48.2	36.4
11	1,260	65.3	18.0	8.6	4.4	1.1	2.6	97.4	58.6	44.0
12	1,052	74.4	10.0	8.3	3.7	1.9	1.6	97.4	59.1	48.1
13	758	70.3	14.7	6.3	3.3	2.4	3.0	97.1	59.9	47.4
14	619	67.2	16.0	8.1	3.8	2.2	2.6	97.2	52.2	40.5
15	445	72.3	11.5	5.9	4.4	2.2	3.7	94.8	51.4	42.7
≥16	64	62.5	15.1	3.1*	0.0	0.0	19.3	94.7	57.2	28.0

* relative standard error $\geq 40\%$

More than 93% of all students had no deciduous or permanent teeth missing due to caries. However, smaller percentages avoided having fillings, and this was associated with age. An increase in the percentage of children presenting with fillings was seen up to the age of 10, a decline occurred to the age of 13, followed by a subsequent increase. Children aged 9 and 10 had the most fillings, with approximately 51% of these children having at least one filling present.

There was a reasonably consistent decline in the percentage of children with no clinical caries experience in either their deciduous or permanent dentition (dmft+DMFT = 0), from 57.7% of 2–4-year-olds to 36.4% of 10-year-olds, with the percentage subsequently increasing to 48.1% for 12-year-olds before declining again.

Changes since 1999

There were decreases in the percentages of children with clinically detectable decay between 1999 and 2000 for several age groups. Overall, there were increases in d+D = 0 and d+D = 1 while more reductions than increases were seen in the presence of higher levels of decay by age groups. There were also increases between 1999 and 2000 in the percentages of children with dmft+DMFT = 0, with increases greater than 3% for three age groups (11, 13 and 15).

Fissure sealants

The mean number of fissure sealants per child (see Table 8) peaked for 15-year-olds. Children with some clinical caries experience (DMFT = 1+) were more likely to have fissure sealants than those with no clinical caries experience (DMFT = 0) across all age groups (excluding children aged ≥ 16). This is consistent with the targeting of sealants to children with greater disease experience.

Table 8: 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	1,302	0.09	0.51	1,209	2.6	93	9.7
7	1,445	0.43	1.12	1,233	14.0	212	22.6
8	1,292	0.71	1.33	1,026	24.2	266	34.2
9	1,232	0.88	1.58	918	27.2	314	35.7
10	1,271	0.89	1.49	871	28.8	400	36.6
11	1,260	0.93	1.57	799	30.9	461	36.8
12	1,050	0.93	1.74	589	29.3	461	35.2
13	758	1.00	1.78	381	23.7	377	40.5
14	614	1.02	1.87	264	27.8	350	38.7
15	445	1.31	2.49	194	34.2	252	39.9
≥ 16	64	0.83	1.45	23	36.1	40	25.4

Changes since 1999

The mean number of fissure sealants was higher for five age groups in 2000 than in 1999 but lower for five age groups. The largest increases occurred for children aged 13 and 15 (19.1% and 21.3% respectively) while the largest decreases occurred for children aged 8 and 14 (9.0% and 8.9% respectively). There were no consistent changes in the percentages of children with fissure sealants by those children without and those with caries experience.

Immediate treatment needs

As can be seen from Table 9, immediate treatment needs were observed for between 1.7% and 4.1% of children aged 5–15 years. These children had a higher mean dmft and mean DMFT and, for most age groups, a higher percentage with 5 or more decayed teeth in comparison with the overall sample. These patterns of caries experience support the view that caries constitutes a substantial burden of disease for this minority of children, and that it presumably contributes to immediate needs for treatment of pain or infection.

Changes since 1999

The percentages of children with immediate treatment needs were lower for almost all age groups than in 1999. However, compared to 1999, in 2000 mean dmft and DMFT scores were higher for a number of age groups with many of these increases being substantial.

Table 9: Immediate treatment needs – age-specific distribution

Age	Children		dmft		DMFT		d+D =				
							1	2	3	4	5+
	<i>n</i>	%	mean	SD	mean	SD	%	%	%	%	%
5	34	3.6	4.25	3.03	–	–	22.6	5.9*	10.6*	2.7*	45.8
6	54	4.1	4.86	3.80	0.18*	0.91*	19.6	18.4	3.9*	3.6*	41.3
7	45	3.1	4.67	3.01	0.60	1.15	11.1*	11.7	14.6	21.1	25.2
8	30	2.3	5.33	3.75	0.61	1.15	24.3	19.4	5.6*	5.0*	16.7
9	42	3.4	3.33	3.12	0.47	0.80	28.6	8.2*	4.3*	5.3*	11.3*
10	36	2.8	2.29	2.82	1.94	1.59	31.8	13.2*	3.0*	0.0	5.9
11	47	3.7	0.44*	1.41*	1.58	2.00	23.8	2.9*	4.9*	0.0	2.0*
12	17	1.7	0.75*	1.43*	2.52	3.06	16.0*	23.6*	13.5*	15.7*	8.9*
13	15	1.9	0.14*	0.53*	3.64	3.18	15.5*	17.9*	0.0	0.0	36.2
14	15	2.4	1.89	2.18	3.12	2.87	11.1*	0.0	0.0	52.3	8.6*
15	10	2.3	0.20*	0.42*	1.33*	2.05*	19.7*	19.6*	0.0	0.0	0.0
≥16	1	1.7*	–	–	10.00	–	0.0	0.0	0.0	0.0	100.0

* relative standard error ≥ 40%

School Dental Service examinations

Table 10 refers to the total number of examinations for children sampled during 2000 (weighted only by HSD). The percentage of children with no previous examination in the School Dental Service was greatest among those up to 4 years of age and reduced to less than 4% for children aged older than 7 years. The inverse of this pattern can be seen for the percentage of children with a previous examination, although relatively greater percentages of the youngest and oldest children had an unknown previous examination status.

Among children with a previous examination (see Table 11) approximately one-third within most ages had received examinations within a period of 13–18 months. A re-examination interval of 7–12 months also occurred for approximately one-quarter to one-third of the remaining children, being most frequent for children aged up to 4 years (75.3%) and occurring for between 19.2% and 47.5% of 5–15-year-olds. Few children had been examined in the previous 6 months, however approximately one-quarter of children aged 13 years or over had had their last examination more than 18 months previously.

Changes since 1999

In comparison to 1999, there were consistent trends for children to have had fewer examinations between 13 and 18 months previously, and increased percentages between 19–24 months and 25+ months previously. This resulted in increased mean months since last examination for all but two age groups. Increases ranged from 0.1 months for 6-year-olds (0.8% increase) to 2.59 months for 15-year-olds (15.1% increase). It should also be noted that more children were indicated as having an unknown previous examination in 2000 than in 1999.

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

Age	Children examined <i>n</i>	Previous examination in School Dental Service		
		No %	Yes %	Unknown %
≤4	335	57.6	8.8	33.6
5	1,119	40.6	26.1	33.3
6	1,489	16.5	54.6	28.9
7	1,495	6.3	71.9	21.8
8	1,287	3.7	77.4	18.8
9	1,221	3.4	79.0	17.6
10	1,234	2.8	78.8	18.4
11	1,149	3.0	82.1	14.9
12	1,007	1.7	78.2	20.1
13	696	2.2	73.3	24.5
14	555	3.3	75.6	21.2
15	372	4.2	78.5	17.3
≥16	55	2.0*	62.4	35.6

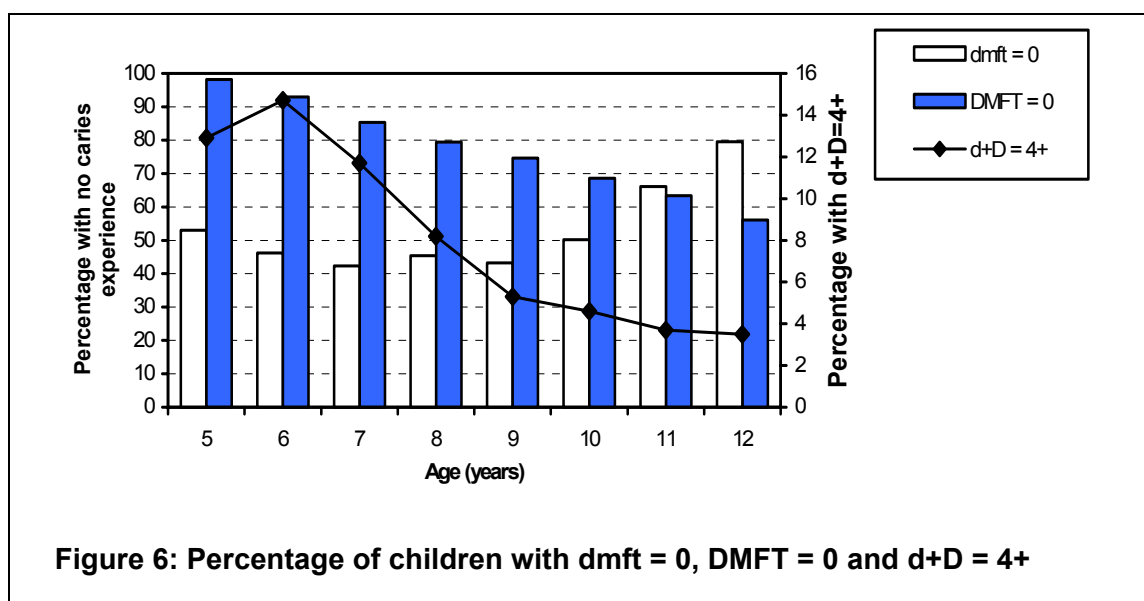
Table 11: School Dental Service examinations – time since last visit

Age	Children <i>n</i>	Months since last visit					mean	SD
		0–6	7–12	13–18	19–24	25+		
≤4	30	9.4*	75.3	7.8*	7.5*	0.0	11.78*	3.50*
5	292	14.4	47.5	21.0	7.0	10.0	12.62	7.43
6	813	7.3	39.2	41.6	8.8	3.1	13.20	4.77
7	1,075	4.3	32.9	40.7	15.0	7.2	15.02	5.89
8	997	3.7	36.4	34.7	12.8	12.4	15.54	7.25
9	965	4.7	33.9	34.8	17.5	9.1	15.46	6.82
10	972	3.9	26.6	39.3	16.5	13.7	16.33	7.10
11	944	2.9	30.7	32.9	16.7	16.9	17.16	9.10
12	787	4.5	30.7	37.3	16.1	11.3	16.24	8.61
13	510	2.8	25.6	40.4	14.1	17.1	17.66	10.17
14	419	0.7*	23.3	36.8	18.4	20.8	18.48	8.80
15	293	1.2*	19.2	34.2	18.9	26.6	19.80	9.00
≥16	34	0.0	11.6*	44.5	24.0	19.9	19.85	13.11*

* relative standard error ≥ 40%

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

Figure 6 presents data contained in Tables 4, 6 and 9 to summarise the extent of dental health (represented by percentage with no clinical caries experience) and the extent of more extensive untreated decay (represented by the percentage with d+D = 4 or more).



Caries experience by Health Service District

Tables 12 and 13 describe the mean caries experience of the 5–6-year-old deciduous and 12-year-old permanent dentition respectively by Health Service District. There were often large differences between HSDs in both dentitions. However, there were small numbers of children sampled in some HSDs (indicated by an asterisk) and mean caries experience scores for these areas should be interpreted with due care.

Table 12: Five–six-year-old deciduous caries experience by Health Zone by Health Service District

Health Service District	n	Decay (d)		Missing (m)		Filled (f)		dmft	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD
Northern Zone									
Bowen	30	2.13	3.55	0.70	1.99	0.97	1.67	3.80	4.58
Cairns	44	1.82	2.93	0.11	0.54	1.30	2.53	3.23	4.26
Charters Towers*	7	1.00	2.24	0.00	0.00	0.57	1.51	1.57	2.44
Innisfail	34	1.94	2.28	0.26	1.38	0.79	1.95	3.00	3.64
Mackay	116	1.15	2.43	0.07	0.37	0.71	1.60	1.92	3.10
Moranbah	20	0.85	1.39	0.00	0.00	1.40	1.90	2.25	2.83
Mount Isa	31	1.68	2.50	0.00	0.00	0.84	1.70	2.52	2.78
Tablelands	10	2.30	2.00	0.00	0.00	1.20	1.87	3.50	2.07
Townsville	199	1.08	2.00	0.07	0.33	0.80	1.77	1.95	3.05
Central Zone									
Banana*	4	0.00	0.00	0.00	0.00	2.00	2.45	2.00	2.45
Brisbane North	254	1.04	1.74	0.03	0.22	0.57	1.50	1.64	2.63
Central Highland*	8	2.13	2.64	0.25	0.71	0.75	1.75	3.13	3.00
Fraser Coast*	2	3.00	4.24	0.00	0.00	0.00	0.00	3.00	4.24
Gladstone*	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gympie	60	1.12	2.21	0.02	0.13	1.53	2.49	2.67	3.14
Redcliffe/Caboolture*	5	0.60	0.89	0.20	0.45	2.00	2.55	2.80	3.83
Rockhampton	47	1.36	2.24	0.00	0.00	0.60	1.28	1.96	2.77
South Burnett*	3	0.33	0.58	0.00	0.00	0.00	0.00	0.33	0.58
Sunshine Coast	129	1.07	2.21	0.08	0.48	0.77	1.67	1.91	3.09
Southern Zone									
Bayside	104	0.94	1.77	0.14	0.78	0.88	1.68	1.97	2.82
Charleville*	6	1.00	1.27	0.83	2.04	3.17	3.13	5.00	5.44
Gold Coast	1,832	1.27	2.20	0.03	0.27	0.64	1.54	1.94	2.91
Logan/Beaudesert	118	1.12	2.08	0.20	1.34	0.59	1.46	1.92	3.14
Northern Downs	34	1.79	3.02	0.00	0.00	0.62	1.50	2.41	3.62
QEII	280	1.31	2.52	0.08	0.36	1.12	2.18	2.51	3.58
Roma*	8	0.38	0.52	0.00	0.00	0.87	2.48	1.25	2.76
Southern Downs	46	1.50	1.99	0.17	0.64	0.72	1.63	2.39	3.38
Toowoomba	66	1.68	2.44	0.12	0.57	0.95	1.75	2.76	3.11
West Moreton	43	1.35	1.95	0.00	0.00	1.63	2.49	2.98	3.53

* Fewer than 10 subjects sampled, results may not be representative

Table 13: Twelve-year-old permanent caries experience by Health Zone by Health Service District

Health Service District	n	Decay (D)		Missing (M)		Filled (F)		DMFT	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD
Northern Zone									
Bowen*	9	1.44	1.81	0.00	0.00	0.89	1.83	2.33	3.00
Cairns*	5	0.40	0.89	0.00	0.00	3.00	3.00	3.40	2.61
Charters Towers*	7	0.86	1.22	0.00	0.00	1.29	1.11	2.15	1.35
Innisfail*	6	1.17	1.84	0.00	0.00	0.83	0.98	2.00	2.76
Mackay	35	0.60	1.24	0.00	0.00	0.63	1.03	1.23	1.52
Moranbah*	7	0.29	0.49	0.00	0.00	1.00	1.41	1.29	1.38
Mount Isa*	8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tablelands*	8	0.38	0.74	0.00	0.00	1.00	1.41	1.38	2.07
Townsville	73	0.32	0.80	0.08	0.52	0.62	1.20	1.01	1.73
Central Zone									
Brisbane North	114	0.31	1.01	0.01	0.09	0.46	0.92	0.78	1.58
Bundaberg*	3	0.67	1.16	0.00	0.00	0.67	1.16	1.33	1.15
Fraser Coast*	1	0.00	–	2.00	–	1.00	–	3.00	–
Gladstone*	7	0.14	0.38	0.00	0.00	0.14	0.38	0.29	0.49
Gympie	12	0.17	0.58	0.00	0.00	0.42	0.79	0.58	0.90
Redcliffe/Caboolture*	3	2.33	0.58	0.00	0.00	0.33	0.58	2.67	1.15
Rockhampton	12	1.33	1.61	0.00	0.00	0.25	0.87	1.58	1.62
South Burnett*	4	0.50	0.58	0.00	0.00	1.00	2.00	1.50	2.38
Sunshine Coast	52	0.35	0.79	0.25	1.30	0.92	1.45	1.52	1.99
Southern Zone									
Bayside	40	0.08	0.27	0.00	0.00	0.57	0.98	0.65	1.10
Gold Coast	1,334	0.35	0.85	0.02	0.20	0.50	1.07	0.86	1.50
Logan/Beaudesert	34	0.29	0.80	0.00	0.00	0.85	1.44	1.15	1.83
Northern Downs*	6	0.50	0.84	0.00	0.00	0.17	0.41	0.67	0.82
QEII	104	0.38	0.87	0.08	0.36	0.68	1.38	1.13	1.76
Roma*	4	0.50	0.58	0.00	0.00	0.00	0.00	0.50	0.58
Southern Downs	18	1.06	1.43	0.00	0.00	1.44	1.76	2.50	2.85
Toowoomba	51	0.43	0.73	0.00	0.00	0.49	0.99	0.92	1.15
West Moreton	25	0.20	0.71	0.00	0.00	0.88	1.48	1.08	1.85

* Fewer than 10 subjects sampled, results may not be representative

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