



# The Child Dental Health Survey, Queensland 1998

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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 1997 and 1998 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 among all patients of the ASDS which was administered through each of the State and Territory health authorities. There was no attempt to obtain information about those students not enrolled in the ASDS. From the inception of the Survey, data have been collected by School Dental Service staff.

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 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. Those changes were adopted uniformly by the end of 1991.

## **Survey methods**

Data for the Child Dental Health Survey were collected during the 1998 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.

Processing and editing of all data forms was performed by the AIHW Dental Statistics and Research Unit. 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 HSDs and within these varied by clinics. The number of children sampled in each district and the sampling procedure predominantly used are given in Table 1. HSDs are presented by Health Zones, the geographic coverage of which are shown in Figure 1. While most districts utilised the intended sampling procedure one region sampled all children with dates of birth between the 1<sup>st</sup> and 6<sup>th</sup> of any month and in two districts sampling by date of birth was not carried out. 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. Overall, 69.5% of the children were sampled on the basis of them having been born on the 1<sup>st</sup> or 6<sup>th</sup> of the month.

As can be seen, the bulk of the children came from the Brisbane North, Bayside, Gold Coast and QEII HSDs. There were few children sampled from Bundaberg, Cairns, Charters Towers, Charleville and Roma, South Burnett and Tablelands HSDs. Several districts failed to sample any children.

### Changes since 1997

The areas of reporting have changed between 1997 and 1998 from Statistical Subdivisions as used by the Australian Bureau of Statistics to HSDs which are currently used by Queensland Health. This has resulted in an increase in areas of sampling from 13 to 34 (the four districts comprising Brisbane North have been combined and the Yeronga district has been included in QEII). Direct comparisons in areas of sampling between 1997 and 1998 are, therefore, not available.

## 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.

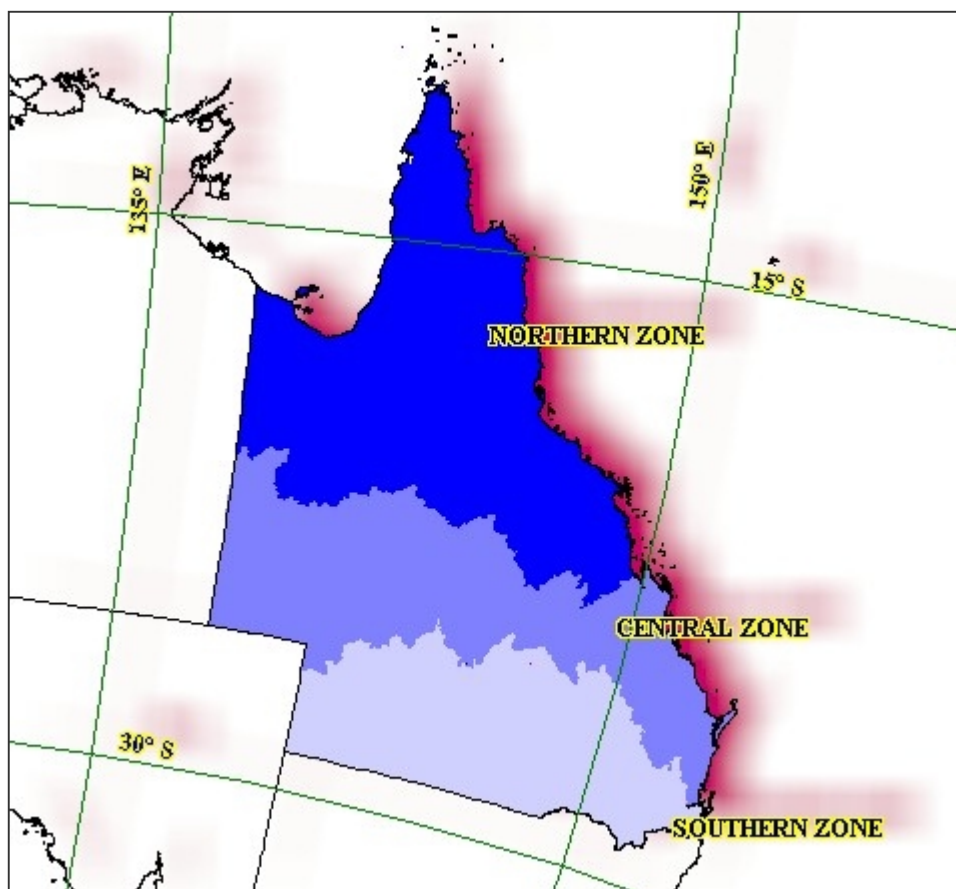
Dental health status data items include a count of the number of teeth which were decayed, missing (because of dental caries) or filled (because of dental caries). Separate counts of caries experience were made of deciduous and permanent teeth. A count of the number of permanent teeth with fissure sealants (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.

**Table 1: Number of children sampled and sampling procedure by Health Zone and District**

Health Services District	<i>n</i>	Sampling procedure	Per cent sampled at most common sampling procedure	Most common sampling ratio
<b>Northern Zone</b>				
Bowen	99	1 and 6	100.0	1 : 15
Cairns	7	1 and 6	100.0	1 : 15
Charters Towers	34	1 and 6	100.0	1 : 15
Innisfail	50	All	100.0	1 : 1
Mackay	557	1 and 6	99.5	1 : 15
Moranbah	156	1 and 6	100.0	1 : 15
Mount Isa	60	1 and 6	100.0	1 : 15
Tablelands	1	?	?	?
Townsville	654	1 and 6	99.8	1 : 15
<b>Central Zone</b>				
Banana	62	1 and 6	100.0	1 : 15
Brisbane North	1,520	1 and 6	97.2	1 : 15
Bundaberg	12	1 and 6	100.0	1 : 15
Central Highland	183	1 and 6	100.0	1 : 15
Gladstone	142	1 and 6	98.6	1 : 15
Gympie	225	1 and 6	100.0	1 : 15
Redcliffe/Caboolture	322	1 and 6	99.4	1 : 15
Rockhampton	150	1 and 6	99.3	1 : 15
South Burnett	6	1 and 6	100.0	1 : 15
Sunshine Coast	631	1 and 6	98.1	1 : 15
<b>Southern Zone</b>				
Bayside	1,501	1 – 6	87.1	1 : 5
Charleville	30	1 and 6	93.3	1 : 15
Gold Coast	3,041	All*	81.0	1 : 1
Logan/Beaudesert	183	1 and 6	94.0	1 : 15
Northern Downs	92	1 and 6	100.0	1 : 15
QEII	1,344	1 and 6	93.1	1 : 15
Roma	1	?	?	?
Southern Downs	283	1 and 6	99.3	1 : 15
Toowoomba	652	1 and 6	99.5	1 : 15
West Moreton	444	1 and 6	99.8	1 : 15
Unknown	430	1 and 6	60.0	1 : 15

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



**Figure 1: Queensland by Health Zone**

## 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 analyses after a visual check identified a number of suspicious cases. In addition, linear regression of age on the number of deciduous and permanent decayed, missing or filled teeth revealed numerous 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.

Cases from HSDs with very few children sampled were removed from the data set where their inclusion was likely to significantly influence the results. As a result, cases from Cairns, Bundaberg, Roma, South Burnett and Tablelands HSDs were excluded.



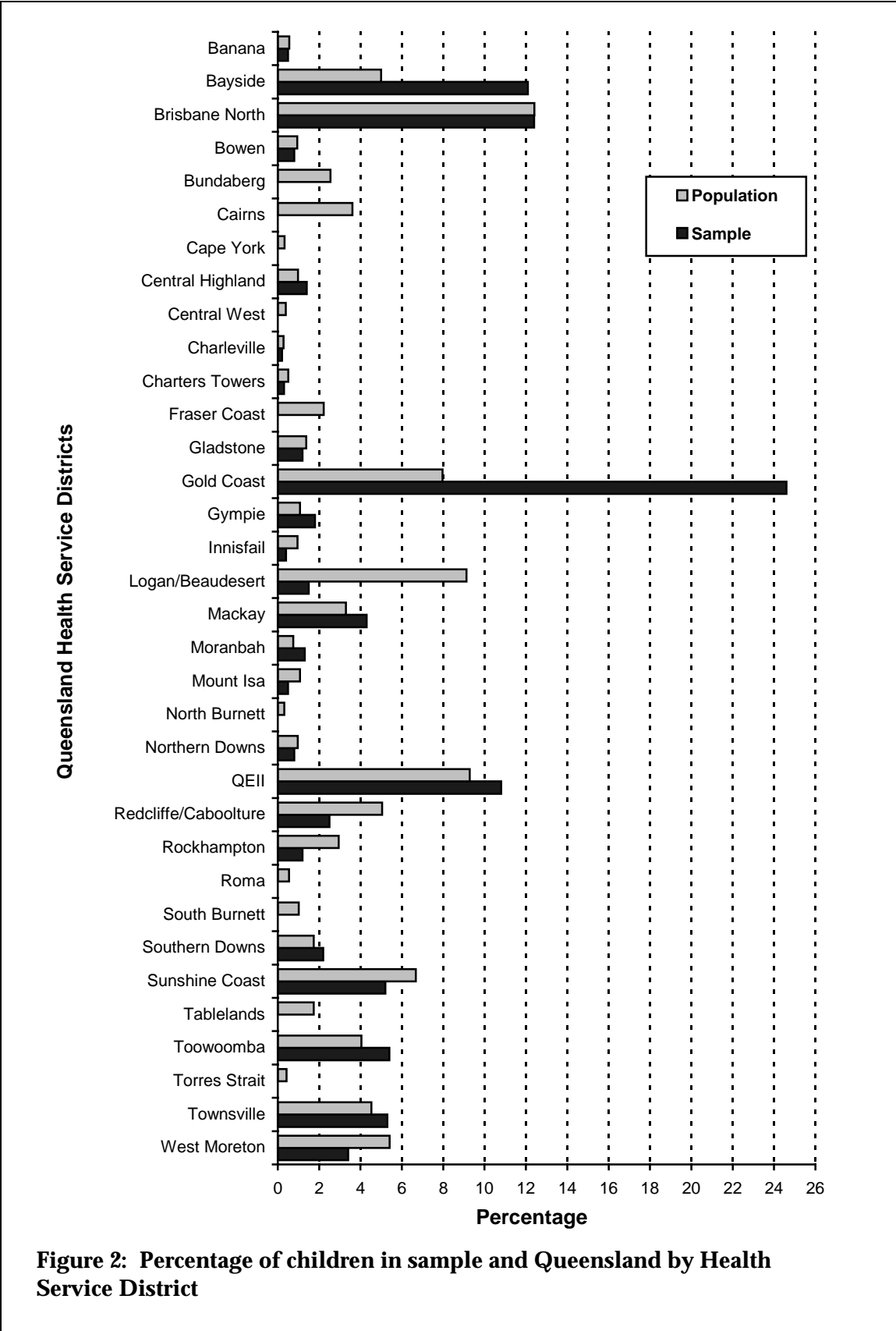
## Analyses

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. Elsewhere the probability was approximately 0.066 (*ie* equivalent to the ratio of 1:15) for students sampled according to the intended procedure and approximately 0.2 for students sampled on the basis of dates of birth falling between the 1<sup>st</sup> and 6<sup>th</sup> of any month (i.e., equivalent to the ratio of 1:5). 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:

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

Weighted records 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 1998 by Statistical Local Areas as published by the Australian Bureau of Statistics (1999). The relative sample sizes and population estimates by HSD as a percentage of the total sample and Queensland population are shown in Figure 2. The final unit record weights were applied to all statistics computed for Tables 2 to 10 such that the weighted contribution of each HSD was proportional to the percentage represented by each HSD of the relevant Queensland population.



## Demographic composition of the sample

A total number of 12,410 children were sampled during 1998 (see Table 2). The majority of children in the complete sample were aged between 5 and 15 years inclusive (97.4%). There were very small numbers of children aged less than 4 or greater than 15 years. In the weighted distribution males were represented in slightly smaller numbers ( $n = 6,176$ ) than females ( $n = 6,236$ ). There was little difference between the average age of males (mean = 9.22) and that of females (mean = 9.24).

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 which make them less representative of their respective age groups within the Queensland population.

### Changes since 1997

The total number of children sampled in 1998 was 3,606 cases more than for 1997. In other respects the percentage age and sex distribution after weighting did not change substantially in 1998.

**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	2	1	3	0	0	0	2	1	3
3	5	3	8	0	0	0	6	5	10
4	132	128	261	1	0	1	155	149	305
5	417	441	858	3	3	6	494	490	984
6	949	927	1,879	150	167	321	728	663	1,395
7	597	590	1,191	5	10	15	687	711	1,402
8	550	523	1,073	8	9	17	654	654	1,308
9	463	532	995	8	0	8	601	647	1,248
10	522	512	1,035	4	5	9	684	705	1,389
11	514	539	1,055	3	4	7	633	668	1,303
12	817	871	1,689	117	127	245	559	626	1,185
13	373	368	741	2	1	3	414	411	825
14	290	268	559	0	1	1	312	283	597
15	190	188	378	0	0	0	219	197	416
16	20	22	42	0	0	0	24	21	45
17	5	4	9	0	0	0	6	4	10
18	0	0	0	0	0	0	0	0	0
19	0	1	1	0	0	0	0	1	1
<b>Total</b>	<b>5,846</b>	<b>5,918</b>	<b>11,777</b>	<b>301</b>	<b>327</b>	<b>633</b>	<b>6,176</b>	<b>6,236</b>	<b>12,427</b>

## Country of birth (including Indigenous status)

As shown in Table 3, the birthplace/Indigenous status of 68.5% of children was missing or recorded as not known. Australian-born (non-Indigenous) children represented 96.7% of the remainder of the sample (30.5% of the total sample). Students identified as Australian-born Aboriginal comprised 0.4% of the total 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 childrens' mothers these results have been omitted from this report.

### Changes since 1997

There have been few changes in the percentages of children sampled by country of birth between 1997 and 1998.

**Table 3. Country of birth (including Indigenous status)**

Birthplace (Indigenous Status)	Frequency	Percent	Valid percent
	<i>n</i>	%	%
Australia (non-Indigenous)	3,784	30.5	30.7
Australia (Aboriginal)	53	0.4	0.4
Australia (Torres Strait Islander)	14	0.1	0.1
United Kingdom and Ireland	9	0.1	0.1
Other English Speaking	15	0.1	0.1
European	4	0.0	0.0
Middle East (West Asia)	2	0.0	0.0
South East Asia	13	0.1	0.1
Other Asia	11	0.1	0.1
Other	9	0.1	0.1
Not known	8,412	67.7	68.3
Missing	102	0.8	
<b>Total</b>	<b>12,427</b>	<b>100.0</b>	<b>100.0</b>

## Deciduous teeth: age-specific caries experience

Table 4 shows that the mean number of clinically decayed teeth among children aged up to 12 years old declined consistently across age groups, from 1.24 for students aged 5 years of age to 0.15 for 12-year-old students. In contrast, the mean number of filled teeth increased to 1.75 for 8-year-olds before declining to 0.41 for 12-year-olds. Mean dmft scores increased from 1.79 for children aged 5 years to 2.47 for 8-year-olds before declining to 0.57 for 12-year-olds.

Among children with caries experience, the percentage of dmft accounted for by the decayed component declined steadily across age groups, from 87.1% for children aged up to and including 4 years of age to 27.1% for 10-year-olds (Table 5). Between the ages

of 5 and 10 the percentage of children free of clinical caries (dmft=0) ranged from a high of 58.3% among children aged 5 years to a low of 41.0% among 8-year-olds.

Together these distributions suggest that the caries experience of younger children, probably presenting for the first time to the School Dental Service, is mostly represented by untreated decay, and that this is managed in later years to achieve a relatively low frequency of untreated decay.

### Changes since 1997

Changes in mean number of decayed and dmft teeth between 1997 and 1998 were generally small although increases in mean dmft were found for the youngest age group and for children aged 7, 8 and 9. Children up to the age of 4 had considerably higher levels of clinically detectable decay in 1998, higher mean dmft (49.2% higher in 1998 than reported in 1997) and a lower percentage with dmft=0.

**Table 4: 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	318	1.61	2.62	0.02*	0.13*	0.34	1.30	1.97	3.16
5	984	1.24	2.55	0.05	0.42	0.49	1.53	1.79	3.16
6	1,395	1.04	1.87	0.06	0.42	0.94	1.85	2.04	2.96
7	1,402	0.73	1.45	0.11	0.61	1.39	2.31	2.23	3.10
8	1,308	0.67	1.21	0.06	0.54	1.75	2.32	2.47	2.91
9	1,248	0.51	0.99	0.06	0.39	1.58	2.17	2.15	2.62
10	1,389	0.43	0.89	0.03	0.30	1.34	1.89	1.80	2.31
11	1,303	0.31	0.79	0.03	0.22	0.88	1.75	1.21	2.20
12	1,185	0.15	0.52	0.01*	0.19*	0.41	1.12	0.57	1.45

\* relative standard error ≥ 40%

**Table 5: Deciduous dentition – caries experience indices by age**

Age	d/dmft		dmft=0	
	<i>n</i>	%	<i>n</i>	%
≤4	150	87.1	318	52.9
5	411	73.1	984	58.3
6	674	55.4	1,395	51.7
7	729	38.7	1,402	48.0
8	772	31.9	1,308	41.0
9	727	29.2	1,248	41.8
10	718	27.1	1,389	48.3
11	456	29.4	1,303	65.0
12	265	27.7	1,185	77.7

## Permanent teeth: age-specific caries experience

The mean number of clinically detectable decayed teeth increased with increasing age (see Table 6), ranging from 0.01 among 5-year-old children up to 1.44 for students aged 16 to 19 years old. Similarly, across the same age range, the mean number of fillings ranged from 0.01 to 1.72. DMFT scores increased from 0.02 among 5-year-olds to 3.37 for the oldest age group. The mean DMFT score for 12-year-old students was 1.22. Among students aged 11 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 substantially across older age groups (Table 7). It is noteworthy that for age groups up to 12 years, more than 54% 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 (D/DMFT) decreased from 85.8% for 6-year-olds to a low of 31.4% for 15-year-olds.

### Changes since 1997

There were no consistent changes in either clinically detectable decay or DMFT scores between 1997 and 1998. Scores for several age-groups increased while decreases occurred for other age groups. Increases in the percentage of DMFT expressed as decay occurred for children aged 5, 9, 14, 15 and those aged 16 years and over, while a reduction was shown in 10-year-olds. There were also small increases for some age groups in the percentage with DMFT=0.

**Table 6: 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	984	0.01*	0.17*	–	–	0.01*	0.18*	0.02*	0.25*
6	1,395	0.07	0.35	0.00	0.03*	0.02	0.20	0.09	0.42
7	1,402	0.17	0.57	0.00	0.13*	0.09	0.43	0.26	0.80
8	1,308	0.19	0.56	0.00	0.07	0.17	0.57	0.36	0.85
9	1,248	0.19	0.58	0.01*	0.19*	0.23	0.65	0.43	0.95
10	1,389	0.30	0.80	0.02	0.15	0.55	1.02	0.87	1.47
11	1,303	0.28	0.87	0.01*	0.15*	0.44	0.95	0.74	1.37
12	1,185	0.43	0.98	0.06	0.41	0.73	1.33	1.22	1.93
13	825	0.52	1.21	0.10	0.53	0.95	1.54	1.56	2.28
14	597	0.66	1.31	0.06	0.40	1.21	1.85	1.93	2.54
15	416	0.81	1.67	0.11	0.57	1.43	1.87	2.35	2.81
≥16	56	1.44	2.99	0.20*	0.76*	1.72	2.13	3.37	4.20

\* relative standard error ≥ 40%

**Table 7: Permanent dentition – caries experience indices by age**

Age	D/DMFT		DMFT=0	
	<i>n</i>	%	<i>n</i>	%
5	9	82.3	984	99.1
6	83	85.8	1395	94.0
7	199	69.5	1402	85.8
8	256	57.8	1308	80.5
9	289	44.0	1248	76.9
10	513	32.9	1389	63.1
11	435	37.3	1303	66.6
12	539	35.2	1185	54.5
13	423	32.4	825	48.8
14	347	34.2	597	41.9
15	277	31.4	416	33.5
≥16	37	37.7	56	33.1

## All teeth: age-specific caries experience

Untreated clinical decay in the combined deciduous and permanent dentitions ( $d+D \geq 1$ ) existed for between 28.1% and 45.0% of the sample (see Table 8). The greatest likelihood of untreated decay occurred for children aged up to 5 where 45.0% had  $d+D$  of 1 or more. The most extensive levels of untreated clinical decay ( $d+D=5$  or more) occurred in the youngest children with the percentage of children with  $d+D=5+$  generally decreasing with increasing age of the students.

More than 96% of students aged up to 12 years 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 12, followed by a subsequent increase. The oldest children had the most fillings with 56.8% of 15-year-olds 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 58.0% of 5-year-olds to 34.5% of 10-year-olds, increasing to 46.0% of 11-year-olds before declining again.

### Changes since 1997

There were no substantial changes in the percentages of children with clinically detectable decay between 1997 and 1998. However, decreases in the percentage  $d+D=0$  can be seen in students aged up to 5, and those aged 8, 12, and over 15.

**Table 8: All teeth: age-specific caries experience**

Age	Students <i>n</i>	d + D =						m+M=0 %	f+F=0 %	dmft+ DMFT=0 %
		0 %	1 %	2 %	3 %	4 %	5+ %			
≤4	318	55.0	12.9	8.7	4.7	5.7	13.0	98.3	89.6	52.9
5	984	64.3	10.7	8.1	4.4	3.8	8.8	97.7	85.0	58.0
6	1,395	60.1	14.2	9.6	5.7	3.4	6.9	97.6	70.6	50.3
7	1,402	61.9	15.0	10.8	5.7	3.1	3.5	95.1	60.1	45.0
8	1,308	59.2	19.4	10.3	5.0	2.9	3.2	97.7	48.0	37.1
9	1,248	63.5	18.6	9.0	5.6	1.5	1.9	96.0	47.7	35.9
10	1,389	62.7	19.0	9.2	4.5	2.0	2.7	97.0	43.7	34.5
11	1,303	70.5	14.9	7.4	3.8	1.9	1.7	97.6	56.0	46.0
12	1,185	69.7	15.2	7.2	4.3	2.6	1.0	96.6	56.8	43.9
13	825	71.9	14.2	8.6	2.3	1.2	1.9	95.6	54.8	43.2
14	597	69.6	13.9	6.4	4.9	2.0	3.2	96.9	54.0	41.0
15	416	65.2	14.8	8.8	6.1	3.3	1.8	95.5	43.2	33.1
≥16	56	57.3	22.9	0.7*	0.0	7.7*	11.4*	92.0	46.6	33.1

\* relative standard error ≥ 40%

## Fissure sealants: age-specific experience

The mean number of fissure sealants per child (see Table 9) shows a bimodal distribution, peaking for 8- and 14-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 except for 10- and 16-year-olds. This is consistent with the targeting of sealants to children with greater disease experience.

**Table 9: Fissure sealants: age-specific experience**

Age	Students <i>n</i>	Sealants		Students with sealants			
				DMFT=0		DMFT≥1	
		mean	SD	<i>n</i>	%	<i>n</i>	%
6	1,395	0.10	0.61	1,312	2.3	83	20.2
7	1,402	0.42	1.13	1,203	13.0	199	23.1
8	1,308	0.76	1.42	1,053	25.1	256	29.9
9	1,248	0.64	1.29	959	21.3	289	29.5
10	1,389	0.62	1.34	876	23.8	513	22.8
11	1,303	0.60	1.42	868	19.4	435	26.7
12	1,185	0.56	1.26	646	19.6	539	24.9
13	825	0.80	1.64	402	26.8	423	32.3
14	597	1.08	2.11	250	26.5	347	36.3
15	416	0.78	1.48	139	17.2	277	35.7
≥16	56	1.21	2.74	18	35.3	37	29.2



## Changes since 1997

The mean number of fissure sealants was higher for most age groups in 1998 than in 1997. However, the percentages of students with fissure sealants were, for the most part, unchanged indicating higher numbers of fissure sealants in those children with sealants.

## Immediate treatment needs

As can be seen from Table 10, immediate treatment needs were observed for between 6% and 13% 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 4 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 small minority of children, and that it presumably contributes to immediate needs for treatment of pain or infection.

## Changes since 1997

The percentage of children with immediate treatment needs is similar to that in 1997. However, compared to 1997, in 1998 mean dmft scores were higher for 5–8-year-olds and DMFT scores were generally higher for children aged older than 10.

**Table 10: Immediate treatment needs: age-specific distribution**

Age (yrs)			dmft		DMFT		d+D=				
							1	2	3	4	5+
	<i>n</i>	%	Mean	SD	Mean	SD	%	%	%	%	%
5	106	11.0	2.83	3.84	0.07*	0.55*	10.8	16.8	7.4	6.4	13.8
6	157	11.5	3.46	4.08	0.12	0.41	12.0	14.3	9.5	2.5*	15.6
7	142	10.3	3.60	3.70	0.40	0.93	15.8	12.0	10.9	4.1	7.7
8	158	12.3	2.76	2.87	0.36	0.77	24.0	14.1	7.7	2.8*	4.6
9	121	9.9	2.12	2.90	0.41	0.76	14.8	8.5	9.7	2.9*	2.3*
10	103	7.6	1.98	2.45	1.06	1.54	26.2	6.0	8.5	0.0	10.5
11	102	8.0	1.66	2.57	1.38	2.35	21.1	8.4	12.9	4.1*	3.9*
12	102	8.8	0.50	1.32	1.11	1.65	19.9	5.6	7.0	1.4*	2.1*
13	52	6.4	0.20*	0.76*	1.81	2.70	20.5	6.4*	7.1*	2.2*	0.6*
14	38	6.6	0.21*	0.78*	2.70	2.56	10.2*	7.1*	18.0	4.2*	4.8*
15	30	7.5	–	–	2.13	2.24	19.7	10.9*	8.5*	4.9*	0.0
≥16	5	9.6	0.86*	1.10*	9.01*	9.04*	0.0	0.0	0.0	0.0	61.6

\* relative standard error ≥ 40%

## School Dental Service examinations

Table 11 refers to the total number of examinations for children during 1998. 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 4.6% or less for children aged more than 7 years of age. 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 12) approximately one-third to one-half within most ages had received examinations within a period of 13–18 months. A re-examination interval of 7–12 months occurred for most of the remaining children being most frequent for 5-year-old children (61.2%) and occurring for between 17.8% and 40.5% of 6–15-year-olds. Few children had been examined either in the previous 6 months or longer than 18 months previously, however approximately one-third of children aged 14 years or over had their previous examination more than 18 months ago.

Figure 3 presents graphically time since last visit for 6- and 12-year-old children. There was little difference between the percentage of 6-year-olds who had had an exam within the previous 12 months (43.3%) and the percentage of 12-year-olds (39.3%).

### Changes since 1997

In comparison to 1997, there was a consistent trend for children up to the age of 11 years to have reduced mean months since last examination and for children aged 12 years and over to have an increased mean time since last visit. A higher percentage of children aged between 9 and 11 had an examination between 7 and 12 months previously.

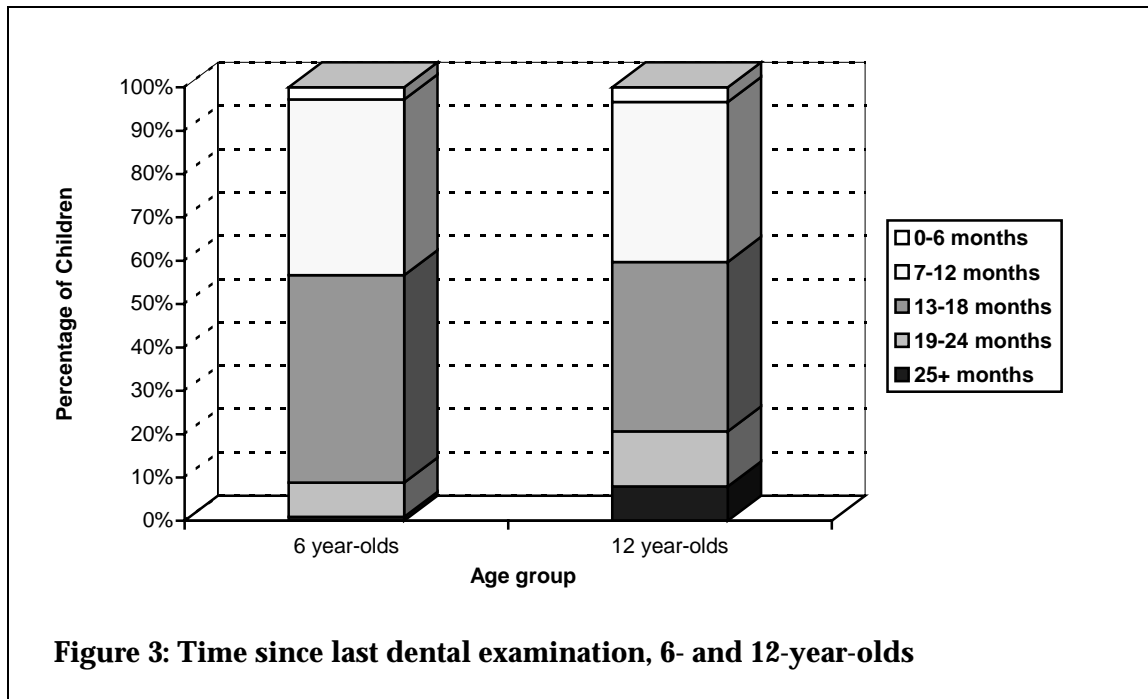
**Table 11: School Dental Service examinations: age-specific distribution**

Age	Students examined <i>n</i>	Previous examination in School Dental Service		
		No %	Yes %	Unknown %
≤4	325	60.5	11.5	27.9
5	1,029	41.1	27.6	31.3
6	1,452	18.8	54.4	26.8
7	1,448	4.6	76.4	19.0
8	1,344	3.2	79.0	17.8
9	1,292	2.6	84.3	13.1
10	1,438	2.1	85.3	12.6
11	1,365	2.4	85.4	12.2
12	1,219	2.4	76.4	21.2
13	852	1.4	72.2	26.4
14	608	1.7	78.3	20.1
15	423	1.5	79.8	18.7
≥16	56	6.3*	45.8	47.9

**Table 12: School Dental Service examinations: time since last visit**

Age	Students	Months since last visit					mean	SD
		0-6	7-12	13-18	19-24	25+		
	<i>n</i>	%	%	%	%	%		
≤4	13	7.2*	22.9*	32.0*	34.7	3.1*	17.15*	9.58*
5	212	8.4	61.2	27.2	0.6*	2.5*	11.63	5.92
6	771	2.8	40.5	47.8	7.9	0.9	13.31	3.85
7	1062	0.9	34.5	49.2	11.5	3.9	14.89	6.40
8	1043	1.7	33.3	45.4	14.2	5.5	15.12	5.97
9	1062	1.7	40.4	38.7	11.0	8.2	14.82	6.00
10	1185	1.0	40.5	38.7	13.0	6.7	14.83	6.42
11	1135	2.0	39.7	39.8	11.1	7.4	14.85	6.92
12	911	3.4	36.9	39.1	12.7	7.9	15.26	7.88
13	600	5.1	37.1	37.8	9.7	10.3	15.46	9.38
14	464	0.6*	22.5	43.4	17.2	16.4	17.67	7.95
15	327	1.7	17.8	48.2	16.4	15.8	17.67	9.18
≥16	25	0.0	11.3*	58.7	5.6*	24.4	18.75	8.31*

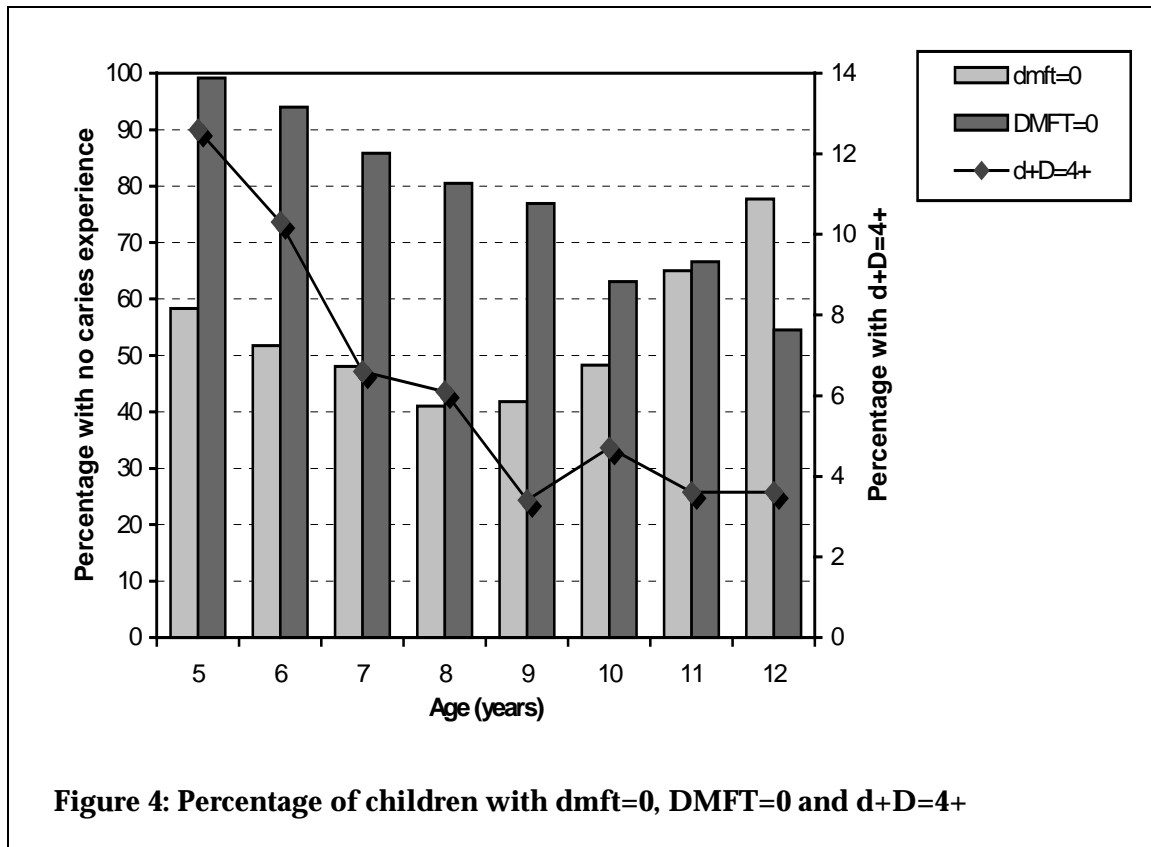
\* relative standard error ≥ 40%



**Figure 3: Time since last dental examination, 6- and 12-year-olds**

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

Figure 4 presents data contained in Tables 4, 6 and 8 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 13 and 14 describe the mean caries experience of the 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 and mean caries experience scores for these areas should be interpreted with due care.

**Table 13: Five-six-year-old deciduous caries experience by Health Zone by Health Service District**

Health Services District	n	Decayed teeth (d)		dmft	
		Mean	SD	Mean	SD
<b>Northern Zone</b>					
Bowen	20	1.60	2.26	2.15	2.35
Cairns	0	–	–	–	–
Cape York	0	–	–	–	–
Charters Towers	4	0.00	0.00	0.25	0.50
Innisfail	28	0.39	0.69	1.57	1.99
Mackay	113	0.88	1.67	1.51	2.67
Moranbah	32	0.38	0.79	1.22	2.39
Mount Isa	9	3.67	4.82	4.11	5.13
Tablelands	0	–	–	–	–
Torres Strait	0	–	–	–	–
Townsville	125	1.38	2.43	1.96	3.11
<b>Central Zone</b>					
Banana	11	2.45	2.88	2.82	3.97
Brisbane North	299	0.84	1.76	1.50	2.67
Bundaberg	0	–	–	–	–
Central Highland	46	1.26	2.72	1.98	3.03
Central West	0	–	–	–	–
Fraser Coast	0	–	–	–	–
Gladstone	22	2.05	3.14	3.14	3.78
Gympie	50	2.10	2.70	3.18	3.32
North Burnett	0	–	–	–	–
Redcliffe/Caboolture	68	0.94	1.51	1.88	2.78
Rockhampton	34	1.06	1.95	2.24	3.51
South Burnett	0	–	–	–	–
Sunshine Coast	138	0.93	1.69	1.91	2.88
<b>Southern Zone</b>					
Bayside	241	0.80	1.45	1.40	2.19
Charleville	6	2.33	1.51	2.67	1.86
Gold Coast	1,256	1.28	2.17	2.10	2.98
Logan/Beaudesert	26	1.04	2.52	2.04	3.30
Northern Downs	11	1.18	1.99	1.82	2.86
QEII	203	1.25	2.61	1.99	3.45
Roma	0	–	–	–	–
Southern Downs	31	1.13	2.08	1.94	3.62
Toowoomba	109	1.29	2.34	2.19	3.16
West Moreton	83	1.53	2.85	2.59	3.69

**Table 14: Twelve-year-old permanent caries experience by Health Zone by Health Service District**

Health Services District	n	Decayed teeth (D)		DMFT	
		Mean	SD	Mean	SD
<b>Northern Zone</b>					
Bowen	4	2.00	1.41	3.50	2.38
Cairns	0	–	–	–	–
Cape York	0	–	–	–	–
Charters Towers	3	1.67	2.89	3.67	6.35
Innisfail	13	0.00	0.00	0.31	0.85
Mackay	48	0.31	0.88	0.85	1.49
Moranbah	20	0.55	1.32	0.80	1.51
Mount Isa	8	0.25	0.46	2.00	2.45
Tablelands	0	–	–	–	–
Torres Strait	0	–	–	–	–
Townsville	55	0.20	0.49	0.78	1.21
<b>Central Zone</b>					
Banana	10	1.40	1.07	2.00	1.63
Brisbane North	123	0.29	0.65	0.76	1.31
Bundaberg	0	–	–	–	–
Central Highland	17	0.00	0.00	1.06	1.64
Central West	0	–	–	–	–
Fraser Coast	0	–	–	–	–
Gladstone	25	0.20	0.41	0.72	0.89
Gympie	14	0.07	0.27	1.14	1.41
North Burnett	0	–	–	–	–
Redcliffe/Caboolture	23	0.91	1.76	2.13	3.05
Rockhampton	9	0.33	0.50	0.33	0.50
South Burnett	0	–	–	–	–
Sunshine Coast	52	0.35	0.68	1.12	1.32
<b>Southern Zone</b>					
Bayside	172	0.35	0.96	0.90	1.74
Charleville	1	–	–	–	–
Gold Coast	1,031	0.55	1.22	1.25	1.85
Logan/Beaudesert	24	0.71	1.23	1.83	2.16
Northern Downs	10	0.70	0.82	2.10	1.73
QEII	123	0.26	0.77	0.98	2.20
Roma	0	–	–	–	–
Southern Downs	29	0.76	1.33	1.48	2.03
Toowoomba	45	0.22	0.52	1.20	1.67
West Moreton	37	0.30	0.78	1.30	1.98

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