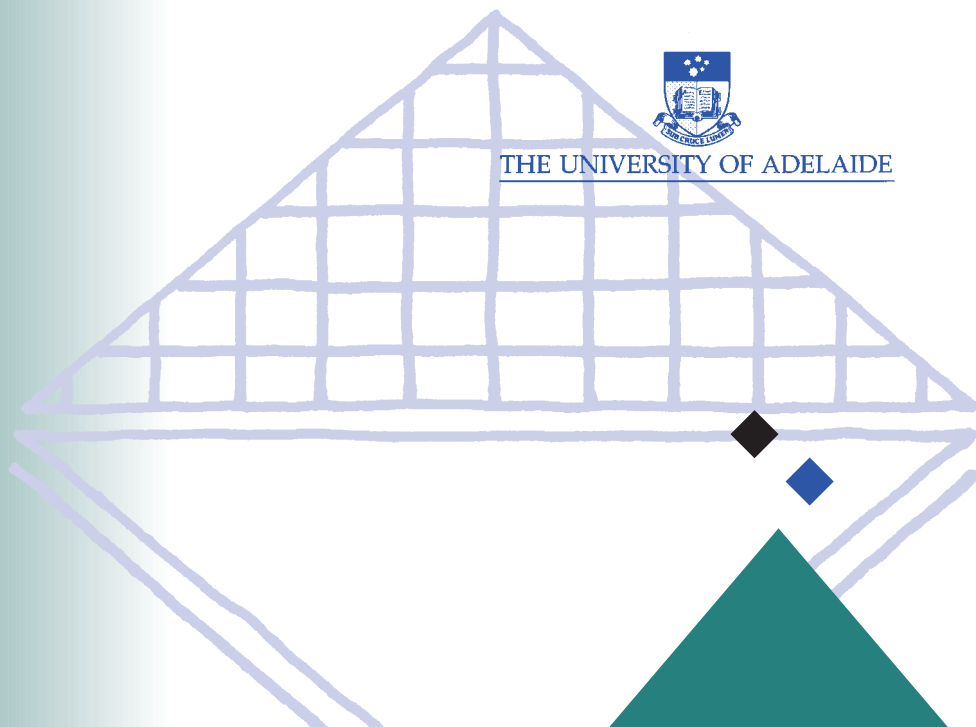


# The child dental health survey Australia 1996

JM Armfield  
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AJ Spencer



THE UNIVERSITY OF 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

dift - deciduous decayed, indicated for extraction and filled teeth

SD - standard deviation

## Purpose of the report

This report provides descriptive epidemiological and service provision data concerning children's dental health in Australia. Data for the report have been derived from the Child Dental Health Survey which monitors the dental health of children in each State and Territory of Australia. The tables and figure contained in this report describe the demographic composition of the sample, deciduous and permanent caries experience, extent of immediate treatment needs, and prevalence of fissure sealants. State/Territory comparisons follow the national tables<sup>1</sup>. The remainder of this report presents a description of the Survey methods and discussion of the findings for the national tables.

## Description of survey methods

### Source of subjects

Data for the report have been derived from the Child Dental Health Survey, which monitors the dental health of children enrolled in school dental services operated by the health departments or authorities of five State and two Territory governments. In New South Wales the School Dental Service has adopted a targeted state-wide screening program termed Save Our Kids Smiles (SOKS). The school dental services provide dental care principally to primary school aged children whereas SOKS incorporates children in various years from Kindergarten to Year 8. The care typically provided by the school dental services includes dental examinations or screenings, preventive services and restorative treatment as required. However, there are some variations among State and Territory programs with respect to priority age groups and the nature of services. As a consequence there are variations in the extent of enrolment in school dental services with some jurisdictions serving more than 80% of primary school children and others serving smaller percentages.

### Sampling

The data for the Child Dental Health Survey are derived for all States and Territories, except NSW, from the routine examinations of children enrolled in the School Dental Service. At the time of examination children are sampled at random by selecting those born on specific days of the month. Victoria and Tasmania adopt other systematic sampling procedures based on selecting  $n$ th case. In NSW full enumeration of all available consenting children is carried out. Different sampling

---

<sup>1</sup> It should be noted that the order of presentation of the States and Territories in data analyses has changed from previous reports to be in line with recommendations by AIHW and the Department of Prime Minister and Cabinet.



**Table 1: Sampling ratios for Australian States and Territories**

State	Sampling Ratio <sup>(a)</sup>	Days of Birth
New South Wales	1:16	1st and 30th
Victoria	1:8	Systematic
Queensland	1:5	1st to 6th <sup>(b)</sup>
	1:15	1st and 6th <sup>(c)</sup>
	1:1	Any <sup>(d)</sup>
Western Australia	1:12.5	29th, 30th, 31st
South Australia	1:12	13th, 30th, 31st
	1:5	13th, 26th to 31st <sup>(e)</sup>
Tasmania	1:2.5	Systematic
Australian Capital Territory	1:2.5	1st to 16th
Northern Territory	1:1.9	1st to 16th <sup>(f)</sup>
	1:1	Any <sup>(g)</sup>

(a) Sampling ratios are approximate only.

(b) Includes Brisbane South, Mackay and South Coast regions.

(c) Includes Brisbane North, Darling Downs, Northern, Peninsula/Torres Strait, Sunshine Coast and West Moreton regions.

(d) Includes South West and Wide Bay regions.

(e) From non-metropolitan clinics and clients previously participating in the Child Fluoride Study.

(f) Includes Darwin.

(g) Includes all Northern Territory outside of Darwin.

ratios, and consequently different days of birth, are used among the States and Territories according to the scheme presented in Table 1. National data for the Child Dental Health Survey therefore constitute a stratified random sample of children from the school dental services. Children not enrolled with the School Dental Service or not consenting to participate in the SOKS program are not represented in the sample. To maintain consistency with previous Australian Child Dental Health Survey reports, the sampling frame previously adopted for NSW is retained for the present analyses: that is, of the available children those born on either the 1st or the 30th day of the month have been selected. The intention of stratification is to provide approximately equivalent numbers of children from each State or Territory, although differences in administration and local data requirements of the Services have created some variation.

## **Introduction of the Save Our Kids Smiles (SOKS) Program in NSW**

Previous NSW data have been based on collections by dental staff on children undergoing examinations within the School Dental Service. However, in 1996 the Dental Health Branch of NSW Health introduced the Save Our Kids Smiles (SOKS) program. SOKS operates on a two-year cycle, providing oral health risk assessment

to children at every school in NSW from Kindergarten to Year 8. Child Oral Health teams visit each government, Catholic parochial and independent school where they conduct an education/motivation session and provide an oral health assessment.

One of the major implications of the change to the SOKS program on data published in this report is:

- Because only children from Kindergarten and Years 2, 4, 6 and 8 are approached each year, children aged 6, 8, 10, 12 and 14 years old are under-represented, with each of these age groups providing approximately half the cases provided by children in the other age groups in this State. Figures for children of these ages may express a bias as those children who are in a school class either above or below the majority of their age cohort may not be representative of the age cohort as a whole.

The NSW program uses a different approach to other States which may cause differences in the comparison tables that are not due to difference in the populations. Therefore, the differences introduced by the SOKS program should be kept in mind when interpreting the present results and, in particular, assessing differences in results between 1995 and 1996. Due to the large Estimated Residential Population of NSW (33.4% of the Australian 4-15-year-old population) the contribution of this State to overall Australian estimates is appreciable.

## **Data items**

Data items in the Child Dental Health Survey are collected at the time of routine clinical examinations conducted by dental therapists and dentists. The recorded characteristics of sampled children encompass demographic information, including the child's age, sex and birthplace (both of child and mother).

The birthplace and the Indigenous status of both patient and mother are considered to be two items essential to a health monitoring survey (Health Targets and Implementation Committee, 1988) and were obtained here from information from the patient's treatment card or medical history. Birthplace categories have been derived from the Australian Bureau of Statistics (1994) in order to ensure the comparability of data obtained from this Survey to other sources such as the Census. Maternal birthplace was chosen as the preferred parental data item. However, birthplace data items are not yet recorded uniformly by each State and Territory: the data reported here for children have been obtained only from the Northern Territory, New South Wales and Queensland, while parental information has been obtained only in Queensland and the Northern Territory. Other States did not collect these data items in 1996. The analysis of variations in health status, with particular regard to variations by Indigenous status, has been pursued in other analyses and is not reported here (see Australian Institute of Health and Welfare, 1998).

Service provision information includes the date of current and previous examination (if the child had been examined previously within the School Dental Service) and is

dealt with in detail within State and Territory-specific reports. Information on last examinations was not collected in NSW (where screenings will now take place every two years) or Western Australia.

The dental health status of sampled children covers the four areas listed below:

- 1) Deciduous caries experience is recorded as the number of deciduous teeth which are decayed, missing because of dental caries, or filled because of dental caries, and is based on the coding scheme of Palmer et al. (1984).
- 2) Permanent caries experience is recorded as the number of permanent teeth which are decayed, missing because of dental caries, or filled because of dental caries, and is based on the World Health Organization protocol (WHO, 1987).
- 3) Immediate treatment needs are designated if, in the opinion of the examiner, the child has, or is likely to develop within four weeks, pain, infection or a life-threatening condition (WHO, 1987). In New South Wales, immediate treatment needs are indicated for children assessed as requiring treatment within a 24–48 hour period. Data collected for the current study on immediate treatment needs do not include children from Victoria, Western Australia, Tasmania or the Australian Capital Territory.
- 4) Fissure sealants are recorded as the number of teeth, otherwise sound and not restored, which have a fissure sealant. This data item was introduced in most States and Territories in 1989.

Some data items are not collected uniformly by all States and Territories. Consequently, some of the tables in this report refer only to specific States and Territories.

The diagnostic criteria employed are based on the clinical judgement of the examining dental therapist or dentist. They follow written criteria for the data items described above; however, there are no formal sessions of calibration or instruction in diagnosis undertaken for the purpose of the Survey, and there are no repeat examinations for the purpose of assessing inter- or intra-examiner reliability.

## **Data analysis and weighting of data**

National data contained in this report consist of counts, means, standard deviations and percentages which have been weighted to represent the relevant State/Territory-specific population of children aged 4–15 years inclusive. The weighting procedure is necessary since the Australian sample is stratified by State/Territory to provide equivalent numbers of cases in each jurisdiction. Unweighted estimates would result in over-representation by children from less populous States/Territories and under-representation by those from more populous jurisdictions. The sample sizes by State and Territory are shown in Table 2.

The weighting method follows standard procedures for weighting stratified samples using external data sources (Foreman, 1991). State/Territory estimates (ABS, 1997) of the 1996 Estimated Resident Population within individual ages are used to provide numerators for weights which are divided by the age-specific number of cases in the sample from respective States/Territories. Hence, observations from more populous States achieve relatively greater weight. However, the stratum-specific weights are further divided by the national Estimated Resident Population and total sample size to achieve numerical equivalence between the weighted sample and the original number of processed records.

Indices are 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.

## Administration of the Survey

The Child Dental Health Survey has been conducted since 1977. Between 1977 and 1988 it was managed centrally by the Commonwealth Department of Health. In 1989 responsibility for the national data collection was transferred to the Australian Institute of Health and Welfare's Dental Statistics and Research Unit at The University of Adelaide.

**Table 2: Number in sample and Estimated Resident Population**

State/ Territory	Processed cases	Estimated resident population (ERP)	ERP/Australian population	Weighted cases
	<i>n</i>	<i>n</i>	%	<i>n</i>
NSW	17,738	1,046,963.40	33.4	27,485.35
Vic.	12,834	758,421.03	24.2	18,250.86
Qld	7,397	591,047.95	18.9	15,512.67
WA	10,120	317,573.22	10.1	8,335.93
SA	3,563	241,429.52	7.7	6,337.25
Tas.	9,151	85,757.09	2.7	2,250.85
ACT	4,799	54,672.60	1.7	1,435.17
NT	14,997	37,972.26	1.2	990.94
<b>Total</b>	<b>80,599</b>	<b>3,133,837.07</b>	<b>100.0</b>	<b>80,599.02</b>

# Description of national findings

## Number in sample and Estimated Resident Population

There was a total of 80,559 children aged between 4 and 15 years inclusive reported for the 1996 calendar year. Children aged 3 years or less and those aged 16 years or more were excluded from this sample as the small numbers of children receiving care in those age groups across Australia results in poor reliability of computed statistics for those ages. Furthermore, children in those ages are outside the main target group of many of the school dental services and it is likely that they have some special characteristics which make them less representative of their respective age groups within the Australian population.

The effects of the statistical weighting procedure can be appreciated from examining Table 2. The relatively large numbers of reported cases from Tasmania and the Northern Territory receive substantially lower weights compared with other States and Territories. Therefore the weighted cases which were used for estimates listed in subsequent tables, represent smaller numbers of children from those jurisdictions. Consequently the national sample was representative of the relative populations of all States and Territories, rather than the number of reported cases.

## Birthplace

Information concerning the birthplace of children (see Table 3) was available only for New South Wales, Queensland and the Northern Territory, with 92.5% of children from these states being born in Australia. Birthplace of mothers was collected only in

**Table 3: Birthplace**

Birthplace	Children		Mothers	
	<i>n</i>	%	<i>n</i>	%
Australia	30,879	92.5	3,491	94.9
United Kingdom and Ireland	167	0.5	49	1.3
Other English speaking	321	1.0	27	0.7
Southern Europe	126	0.4	17	0.5
Other Europe	97	0.3	10	0.3
Middle East	175	0.5	45	1.2
South-East Asia	479	1.4	19	0.5
Other Asia	906	2.7	15	0.4
Other	246	0.7	6	0.2
<b>Total</b>	<b>33,396</b>	<b>100.0</b>	<b>3,679</b>	<b>100.0</b>

Queensland and the Northern Territory. A reported 94.9% of mothers were born in Australia. For children not born in Australia, the predominant regions of birth were South-East Asia (e.g., Indonesia, Philippines, Vietnam), other countries in Asia (e.g., China, Hong Kong, India), other English-speaking countries (e.g., New Zealand, USA.) and the United Kingdom and Ireland. For mothers not born in Australia, the predominant regions of birth were the Middle East, the United Kingdom and Ireland, and other English-speaking countries, although none of these categories exceeded 1.5%.

**Indigenous status**

Information concerning Indigenous status was available for New South Wales, Queensland and the Northern Territory, where for recipients of school dental service care, 3.2% of children were of Indigenous origin (see Table 4). Information on mothers (collected from Queensland and the Northern Territory only) reveals that 13.6% were of Indigenous origin. The difference in percentages between children and mothers is principally due to the difference in the source of data, there being a relatively small percentage of Indigenous people within the NSW population compared to the Northern Territory.

**Table 4: Indigenous status**

Indigenous Status	Children		Mothers	
	<i>n</i>	%	<i>n</i>	%
Non-Indigenous	32,337	96.8	3,179	86.4
Indigenous	1,059	3.2	500	13.6
<b>Total</b>	<b>33,396</b>	<b>100.0</b>	<b>3,679</b>	<b>100.0</b>

## Deciduous teeth: age-specific caries experience

Total caries experience in the deciduous dentition is expressed as the mean number of decayed, missing (due to caries) and filled teeth (dmft), and varied from 1.26 to 1.72 among the key ages of 5- to 9-year-olds (see Table 5). The noticeable decline in dmft for 10 year-olds is a consequence of the natural exfoliation of deciduous teeth. In contrast to the pattern for dmft there was a progressive decrease in the presence of clinically detectable decay, from 0.92 among 5-year-olds to 0.54 among 9-year-olds. As a consequence of both trends, the d/dmft ratio was highest among younger children and declined to approximately 33% by the age of 10 years. The percentage of children with no deciduous caries experience (dmft=0) also steadily declined across the age range 5 to 9 years, from 65.3% to 50.2%.

These patterns suggest that children enter their school years with moderate caries experience in the deciduous dentition – a large proportion of it manifested as clinically detectable untreated decay (almost 80% at 4 years of age). With continued treatment in the school dental services decay experience becomes predominantly represented by past experience, indicated by the presence of fillings, rather than current experience.

**Table 5: Deciduous teeth: age-specific caries experience**

Age (years)	Children in sample	decayed		dmft		d/dmft	Children with dmft=0
		mean	SD	mean	SD	%	%
4	6,820	1.14	2.28	1.44	2.57	79.9	61.6
5	6,889	0.92	1.99	1.26	2.49	76.2	65.3
6	6,868	0.88	1.87	1.45	2.63	65.3	61.0
7	6,708	0.77	1.56	1.66	2.60	50.4	55.2
8	6,648	0.63	1.31	1.68	2.49	41.0	52.9
9	6,642	0.54	1.13	1.72	2.39	35.5	50.2
10	6,764	0.45	1.03	1.47	2.22	33.3	54.6

## Permanent teeth: age-specific caries experience

The mean numbers of clinically detectable decayed permanent teeth and DMFT were smaller than the corresponding means for deciduous teeth across the range of 5 to 10 years (see Table 6). This primarily reflects reduced time-at-risk of those teeth present and at younger ages the low number of permanent teeth present. Mean decay and DMFT for permanent teeth increased with age and continued to increase among older ages even though the number of permanent teeth present stabilises by about 13 years of age. Over 80% of children in each age group 8 years old or less had no permanent tooth caries experience (DMFT=0) and even by the end of their primary school years 61.8% of 12-year-olds had no permanent caries experience.

It is necessary to be cautious in drawing inferences from age-related trends, particularly among those aged over 12 years. In most States and Territories, access to school dental services for those older children tends to be restricted in comparison with access for younger children. Often the older children must meet special eligibility criteria with the consequence that they may be less representative of their respective age groups within the Australian population than is the case for younger children. Also, in Victoria no children older than 13 years of age are sampled, so current estimates for 14- and 15-year-old children do not take Victoria into account.

**Table 6: Permanent teeth: age-specific caries experience**

Age (years)	Children <i>n</i>	Decayed		DMFT		D/DMFT %	Children with DMFT=0 %
		mean	SD	mean	SD		
5	6,889	0.02	0.20	0.02	0.21	91.6	99.0
6	6,868	0.06	0.34	0.07	0.43	85.7	95.9
7	6,708	0.14	0.51	0.18	0.61	76.8	89.3
8	6,648	0.20	0.61	0.30	0.79	68.4	82.6
9	6,642	0.20	0.58	0.38	0.87	54.3	78.3
10	6,764	0.22	0.70	0.49	1.04	46.2	74.1
11	6,759	0.27	0.78	0.66	1.31	41.1	68.2
12	6,774	0.34	0.90	0.90	1.78	40.0	61.8
13	6,760	0.49	1.09	1.35	2.79	44.2	54.7
14	6,605	0.39	0.96	1.30	2.42	29.6	53.7
15	5,103	0.45	1.08	1.46	2.22	32.6	50.6



## All teeth: age-specific caries experience

Table 7 combines components of caries experience from the deciduous and permanent dentition to provide an indicator of the total burden of disease among children receiving care within school dental services.

Untreated clinically detectable decay (d+D of 1 or more) in the combined deciduous and permanent dentition was present for between 21.9 and 35.3% of children in the age range 5 to 15 years. The highest incidence of untreated decay was observed among 8-year-olds (where only 64.7% had d+D=0) while the greatest severity of clinically detectable decay occurred in the youngest ages (e.g., 9.1% of 5-year-olds had 4 or more teeth with clinically detectable untreated decay). Based on observations from previous tables the largest contribution to caries experience among younger children came from deciduous teeth.

Missing teeth were relatively uncommon among children aged 5 to 12 years. The percentage of children with no fillings (f+F=0) and no caries experience (dmft+DMFT=0) showed a bimodal distribution, driven by changes in caries experience resulting from the exfoliation of deciduous teeth and the subsequent eruption of the permanent dentition. Among the key age range of 5 to 12 years old at least 43% of children in any age group had no caries experience in either dentition.

**Table 7: All teeth: age-specific caries experience**

Age (Years)	Children <i>n</i>	d+D=					m+M=0 %	f+F=0 %	dmft+ DMFT=0 %
		0 %	1 %	2 %	3 %	4+ %			
5	6,888	69.2	10.6	7.4	3.7	9.1	97.8	88.7	64.9
6	6,865	67.4	11.6	8.0	4.1	8.9	97.5	81.8	59.8
7	6,706	65.0	13.6	8.2	5.0	8.1	96.5	70.7	52.0
8	6,648	64.7	15.4	8.5	4.9	6.5	95.7	64.0	47.6
9	6,641	65.6	16.0	9.1	4.1	5.1	96.4	58.2	43.9
10	6,763	67.6	16.0	8.2	3.5	4.6	96.9	57.4	44.7
11	6,755	72.0	14.2	7.7	3.0	3.2	98.3	61.8	49.5
12	6,774	74.5	13.2	6.8	2.8	2.7	97.9	63.9	51.4
13	6,756	72.2	13.4	6.5	3.9	4.1	97.6	65.4	50.1
14	6,605	78.1	12.5	4.7	2.2	2.4	94.3	59.3	49.6
15	5,102	76.4	14.2	4.1	1.2	4.3	94.5	64.4	50.2

## Fissure sealants: age-specific experience

The mean number of fissure sealants increased with increasing age (see Table 8) and from the age of 7 years exceeded the mean number of decayed permanent teeth for each respective age group. Children aged 6–14 years old with permanent caries experience (DMFT=1+) were from 33.5 to 675% more likely to have a fissure sealant than children with no permanent caries experience (DMFT=0). For example, 38.4% of 12-year-old children with DMFT=1+ had fissure sealants compared with 28.3% among those with DMFT=0. This can be interpreted as a tendency towards the preferential provision of fissure sealants to children deemed to have a greater likelihood of developing dental caries.

**Table 8: Fissure sealants: age-specific experience**

Age (years)	Children Sealants			DMFT=0		DMFT <sup>≥</sup> 1	
				Children	With fissure sealants	Children	With fissure sealants
	<i>n</i>	Mean	SD	<i>n</i>	%	<i>n</i>	%
6	6,866	0.04	0.34	6,585	1.2	281	9.3
7	6,708	0.20	0.78	5,990	6.5	717	15.9
8	6,648	0.45	1.14	5,493	14.8	1,155	23.8
9	6,642	0.71	1.35	5,204	22.9	1,438	33.4
10	6,763	0.85	1.47	5,015	26.8	1,748	37.4
11	6,755	0.89	1.52	4,609	28.0	2,146	38.4
12	6,774	0.98	1.70	4,184	28.3	2,590	38.4
13	6,757	1.00	1.91	3,697	27.5	3,060	36.7
14	6,602	0.86	1.90	3,549	18.8	3,052	43.5
15	5,102	0.73	1.73	2,581	21.8	2,520	21.6

## Immediate treatment needs: age-specific distribution

Immediate treatment was not recorded in Victoria, Western Australia, Tasmania or the Australian Capital Territory in 1996. Additionally, the protocol for assigning immediate treatment needs in New South Wales has undergone change with a more imminent expectation of pain required for this classification (24–48 hours, in contrast to a four-week period adopted in other States and Territories). The percentage of children with immediate needs was highest for 14-year-olds (9.5%) and lowest for children aged between 5 and 12 years old (see Table 9).

**Table 9. Immediate treatment needs: age-specific distribution**

Age (yrs)	Children	Children in need of immediate treatment										
				dmft		DMFT		d+D=				
		<i>n</i>	%	Mean	SD	Mean	SD	1	2	3	4	5+
5	1,373	58	4.2	4.41	3.61	0.20	0.75	10.6	17.2	21.7	3.7	46.8
6	1,360	63	4.6	5.10	4.32	0.51	1.67	21.9	13.1	14.0	9.3	41.6
7	1,324	66	5.0	4.58	4.16	0.74	1.35	19.0	29.5	13.3	15.4	22.8
8	1,321	57	4.3	4.54	3.60	0.73	1.11	15.2	43.0	8.8	14.8	18.2
9	1,319	53	4.0	4.27	3.71	0.97	1.36	24.3	24.0	17.6	10.7	23.3
10	1,339	50	3.7	3.39	3.76	1.72	1.76	22.3	26.0	22.1	8.3	21.4
11	1,343	43	3.2	1.88	2.47	1.87	2.98	36.8	35.2	13.7	4.9	9.4
12	1,357	71	5.2	1.04	2.10	2.55	2.77	39.4	25.1	11.0	5.8	18.7
13	1,399	112	8.0	0.41	0.88	2.71	2.43	42.9	20.5	21.4	4.8	10.4
14	1,380	132	9.5	0.22	0.96	4.05	3.23	37.4	20.0	19.3	9.8	13.5
15	1,357	107	7.9	0.07	0.28	5.06	4.55	24.9	24.5	21.0	5.7	24.0

Children with immediate treatment needs were found to have considerable caries experience in comparison to children judged not to be in immediate need. Age-specific means for dmft and DMFT tended to be approximately two to eight times higher than the national averages listed in previous tables. For example, 5-year-olds with immediate treatment needs had a mean dmft of 4.41 (compared with 1.26 in Table 5) and 50.5% had d+D=4+ (compared with 9.1% in Table 7).

It should be emphasised that the proportion of those deemed as requiring immediate treatment reflects both the accumulated amount of dental disease and the methods of targeting and delivering school dental services. For example, clinics which provide care for a relatively small proportion of a population and which assign priority to treating those with symptoms will almost certainly record higher percentages of immediate treatment need than other clinics which have universal coverage of all children on a constant recall basis.

Perhaps the most important interpretation of Table 9 is that a sub-group of children with a substantial burden of dental caries can be identified within school dental services. Their state of poor dental health contrasts with the previous observation that approximately one-half of 5- to 12-year-olds have no caries experience.

## Interstate comparison: 5–6-year-old dmft

Combined five and six year-olds represent a standard age group (cited, for example, within World Health Organization publications) and is useful for school dental services since it represents, predominantly, the dental health status of children new to these services. Table 10 shows that a 115% difference existed between the lowest mean dmft (New South Wales, mean=0.92) and the highest mean dmft score (Queensland, mean=1.98). In assessing these differences it should be noted that there are historical differences in caries prevalence as well as marked variations in population density, demography and levels of water fluoridation between these two States. As well, there are differences in the organisation and delivery of school dental services between these two jurisdictions and these differences have widened with the introduction of the SOKS program in NSW. All of these influential factors also affect other State/Territory comparisons.

There are other notable characteristics of the statistics contained in Table 10. In general, the mean number of deciduous teeth with clinically detectable untreated decay was correlated with the mean dmft – a relationship which may not be surprising but which need not necessarily exist. However, variation did exist in the percentage of dmft attributable to clinically detectable decay, ranging from a low of 58.3% in South Australia up to 77.7% in Victoria. The variation in the percentage of children with no caries experience (dmft=0), while representing to some degree the converse of mean dmft, showed considerably less variation than that for mean dmft, ranging from 52.6% for the Northern Territory to 70.7% for New South Wales. In other words, while less than one-half of 5- to 6-year-olds in all jurisdictions had caries experience, the amount of accumulated disease (mean dmft) was variable across jurisdictions.

**Table 10: Interstate comparison: 5–6-year-old dmft**

State/ Territory	Children in sample	d		dmft		Children with dmft=0	
		mean	SD	mean	SD	%	%
NSW	4,690	0.67	1.62	0.92	2.01	76.1	70.7
Vic.	3,332	1.16	2.31	1.57	2.85	77.7	60.6
Qld	2,600	1.17	2.14	1.98	3.07	63.8	53.5
WA	1,397	0.76	1.71	1.22	2.25	62.8	61.1
SA	969	0.63	1.39	1.28	2.48	58.3	64.4
Tas.	369	0.81	1.75	1.29	2.44	65.3	63.3
ACT	231	0.64	1.52	0.95	2.02	71.6	69.2
NT	169	1.28	2.33	1.90	2.92	67.8	52.6
<b>Australia</b>	<b>13,757</b>	<b>0.90</b>	<b>1.93</b>	<b>1.35</b>	<b>2.56</b>	<b>70.5</b>	<b>63.1</b>

## Interstate comparison: 12-year-old DMFT

There was substantial variation in the mean DMFT scores between States (see Table 11) with the highest mean score (1.28 in Queensland) being more than twice that of the lowest (0.52 in South Australia). This was similar to the extent of variation observed for deciduous teeth. In the case of permanent teeth there was again only moderate correspondence between mean DMFT and mean number of decayed teeth. Consequently, there were quite large variations in the ratio of D/DMFT (29.6% in Western Australia to 54.5% in Victoria).

New South Wales and South Australia had the highest percentage of children with no caries experience, both States having over 70% of children with DMFT=0. By contrast, Queensland, Tasmania and Victoria had the lowest percentages of children with DMFT=0, with 51.0, 53.4 and 54.3% respectively. Interestingly, the Northern Territory, which had the lowest percentage of 5-6-year-olds with dmft=0 (52.6%), ranked in the middle of States and Territories in relation to percentages of children with DMFT=0 (65.8%).

**Table 11: Interstate comparison: 12-year-old DMFT**

State/ Territory	Children in sample	D		DMFT		D/DMFT	Children with DMFT=0
	<i>n</i>	mean	SD	mean	SD	%	%
NSW	2,280	0.21	0.63	0.64	1.82	40.3	72.3
Vic.	1,560	0.58	1.18	1.09	1.72	54.5	54.3
Qld	1,313	0.38	0.93	1.28	2.03	30.3	51.0
WA	704	0.28	1.05	0.99	1.75	29.6	57.4
SA	539	0.18	0.54	0.52	1.07	34.6	71.2
Tas.	189	0.40	0.88	0.98	1.44	40.3	53.4
ACT	112	0.19	0.61	0.56	1.02	32.7	69.5
NT	78	0.27	0.81	0.73	1.36	36.8	65.8
<b>Australia</b>	<b>6,774</b>	<b>0.34</b>	<b>0.90</b>	<b>0.90</b>	<b>1.78</b>	<b>40.0</b>	<b>61.8</b>

## Interstate comparison: all teeth age-standardised caries experience

Age-standardised data were used for Table 12 in order to bring together data from all ages (children aged between 5- and 12-years-old inclusive) in all jurisdictions. This is useful in the event that any age-specific statistics (for example, 5- to 6-year-olds) provide an unrepresentative picture of conditions in a specific State or Territory. The purpose of age-standardisation is to adjust among States for possible differences in the proportion of specific age groups, which is important because of the age-relatedness of most dental caries measures.

Table 12 illustrates further areas of interstate variation in caries experience. For example, there are appreciable differences in the percentage of children with 4 or more decayed teeth (d+D=4+). Victoria and the Northern Territory have the highest levels of untreated decay (d+D) whereas South Australia, the Australian Capital Territory, Western Australia and New South Wales have the lowest levels of clinically detectable untreated decay. As noted from previous tables, this arises principally from the relatively high levels of clinically detectable decayed teeth observable in the deciduous teeth of children in their early school years. The percentage of children with no caries experience (dmft+DMFT=0) was highest in NSW (62.5%) which may be at least partly attributable to the recent change to dental screenings in that State. Consistent with Tables 10 and 11, the lowest percentage of children with no caries experience was found in Queensland (42.1%).

**Table 12: Interstate comparison: all teeth age-standardised caries experience**

State/ Territory	Children in sample	Children with d+D=					Children with		
		0	1	2	3	4+	m+M=0	f+F=0	dmft+ DMFT=0
	<i>n</i>	%	%	%	%	%	%	%	%
NSW	18,345	75.3	11.2	6.4	2.8	4.3	98.2	78.8	62.5
Vic.	12,767	58.2	15.7	10.1	5.8	10.3	94.4	67.8	45.7
Qld	10,262	64.6	15.4	8.8	4.3	6.9	96.8	56.7	42.1
WA	5,601	70.7	15.1	7.3	3.3	3.6	98.5	62.0	47.9
SA	4,052	74.4	13.8	6.6	2.8	2.4	98.8	63.7	53.5
Tas.	1,476	66.4	14.9	8.9	4.3	5.6	98.0	62.9	48.1
ACT	906	73.9	13.1	7.2	2.7	3.2	99.5	71.2	57.5
NT	636	64.2	14.4	8.7	4.3	8.4	96.7	67.0	46.3
<b>Australia</b>	<b>54,045</b>	<b>68.3</b>	<b>13.8</b>	<b>8.0</b>	<b>3.9</b>	<b>6.0</b>	<b>97.1</b>	<b>68.4</b>	<b>51.8</b>

## National summary

Age-standardised data were used for Table 13 in order to bring together data from all ages in all jurisdictions.

The data in Table 13 reveal different profiles of caries experience among the States and Territories. Again, Queensland is shown to have the highest levels of caries experience for deciduous teeth (mean dmft = 1.85, 53.4% dmft=0) while children in New South Wales were found to have the least caries experience (mean dmft = 0.84, 70.3% dmft=0). The highest levels of permanent caries experience were found in Queensland (mean DMFT = 0.51, 76.1% DMFT=0) and Victoria (mean DMFT = 0.46, 77.7% DMFT=0). In comparison, the lowest levels were seen in the ACT (mean DMFT = 0.24, 85.7% DMFT=0), South Australia (mean DMFT = 0.25, 84.4% DMFT=0) and New South Wales (mean DMFT = 0.27, 86.4% DMFT=0).

Figure 1 uses Australia-wide data to describe the combined dmft and DMFT indices and their components for individual (year of birth) ages. It should be noted that the rate of decline across age groups in the percentage of children free of caries in the deciduous dentition is set against a corresponding pattern of exfoliation of deciduous teeth.

**Table 13: National summary**

State/ Territory	Children in sample  <i>n</i>	dmft			DMFT		DMFT=0	d+D=0
		Mean	SD	%	Mean	SD	%	%
NSW	18,345	0.84	1.73	70.3	0.27	0.96	86.4	75.3
Vic.	12,767	1.68	2.63	54.9	0.46	1.09	77.7	58.2
Qld	10,268	1.85	2.78	53.4	0.51	1.21	76.1	64.6
WA	5,601	1.21	2.01	58.9	0.40	1.05	79.4	70.7
SA	4,052	1.23	2.14	61.4	0.25	0.71	84.4	74.4
Tas.	1,477	1.36	2.24	58.6	0.41	0.97	78.3	66.3
ACT	906	0.96	1.79	65.2	0.24	0.69	85.7	73.9
NT	636	1.55	2.46	55.1	0.31	0.87	83.2	64.2
<b>Australia</b>	<b>54,053</b>	<b>1.32</b>	<b>2.30</b>	<b>61.0</b>	<b>0.38</b>	<b>1.04</b>	<b>81.2</b>	<b>68.3</b>

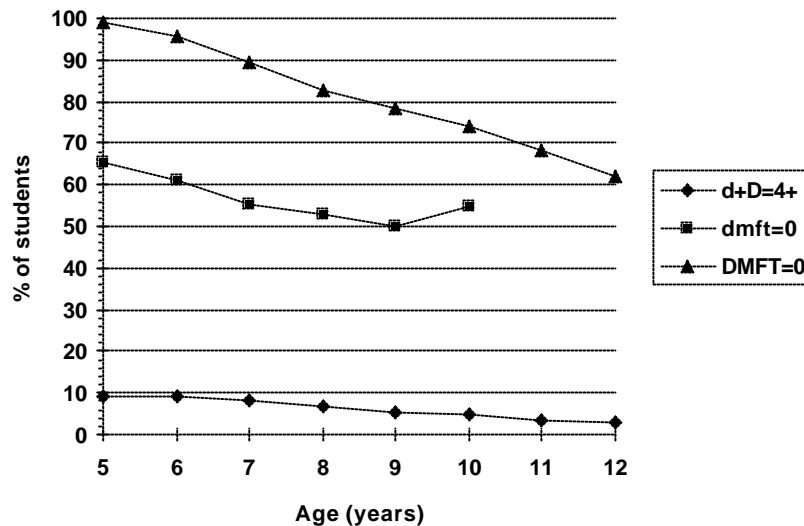


Figure 1: Percentage of children with dmft=0, DMFT=0 and d+D=4+

## National trends

Figures 2 and 3 show the trends in national dift/dmft and DMFT scores between 1977 and 1996. Between these years mean dift/dmft scores for 6-year-old children have reduced by 56.9% from 3.13 in 1977 to 1.45 in 1996. This trend has been mirrored by a reduction in clinically detectable decay across the same period from 1.95 to 0.80, a reduction of 59.0%. The disruption of the downwards trend in caries experience evidenced in 1989 can be seen as representing a change in reporting of caries experience from dif teeth (decayed, indicated for extraction due to caries and filled) to dmf teeth (decayed, missing due to caries and filled). The observed increase in caries experience between 1988 to 1989 may also reflect a change in statistical analyses (especially the use of weighting by state) following from the Dental Statistics and Research Unit taking over administration of the survey from the Commonwealth Department of Health in 1989.

There has also been a dramatic decrease in caries experience in the permanent dentition with mean DMFT scores falling consistently between 1977 and 1996. Mean DMFT for 12-year-old children has fallen by 81.2% between these years, from 4.79 in 1989 to 0.9 in 1996. A similar pattern is observable in the decline in clinically detectable decay, although since 1987 reductions in decay levels have generally been small. The decayed component of the mean DMFT score has fallen from 2.33 in 1977 to 0.34 in 1996, however the period between 1990 and 1995 saw mean decay scores fairly stable at around 0.4 mean decayed teeth per child.



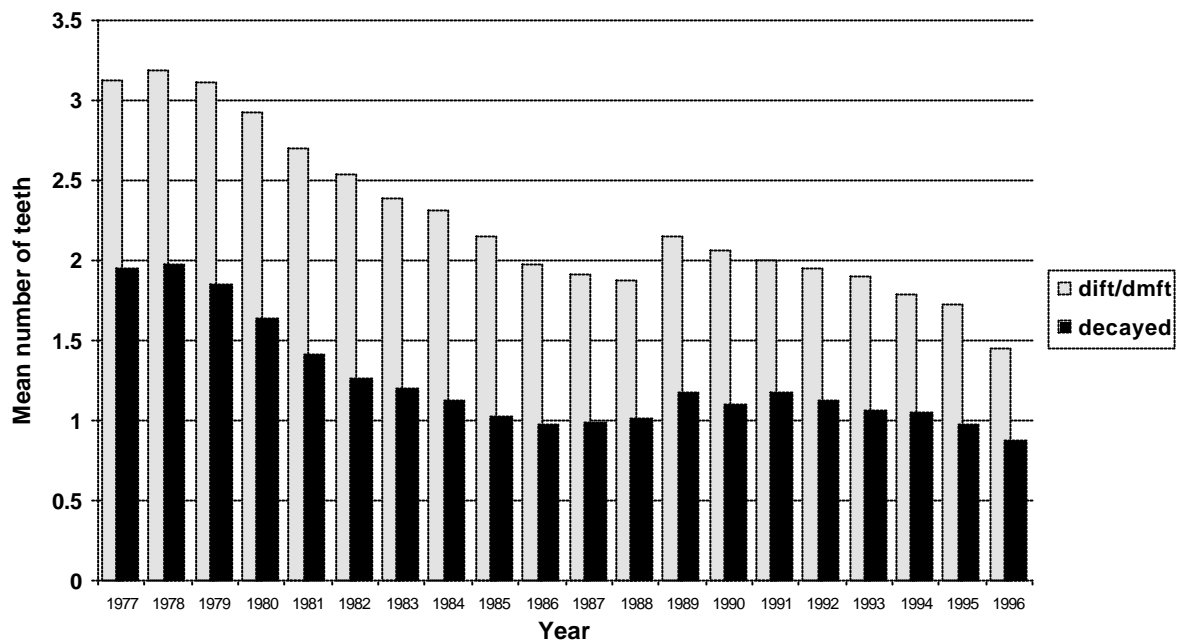


Figure 2. Mean dift/dmft and decayed component for 6-year-old children in Australia from 1977 to 1996.

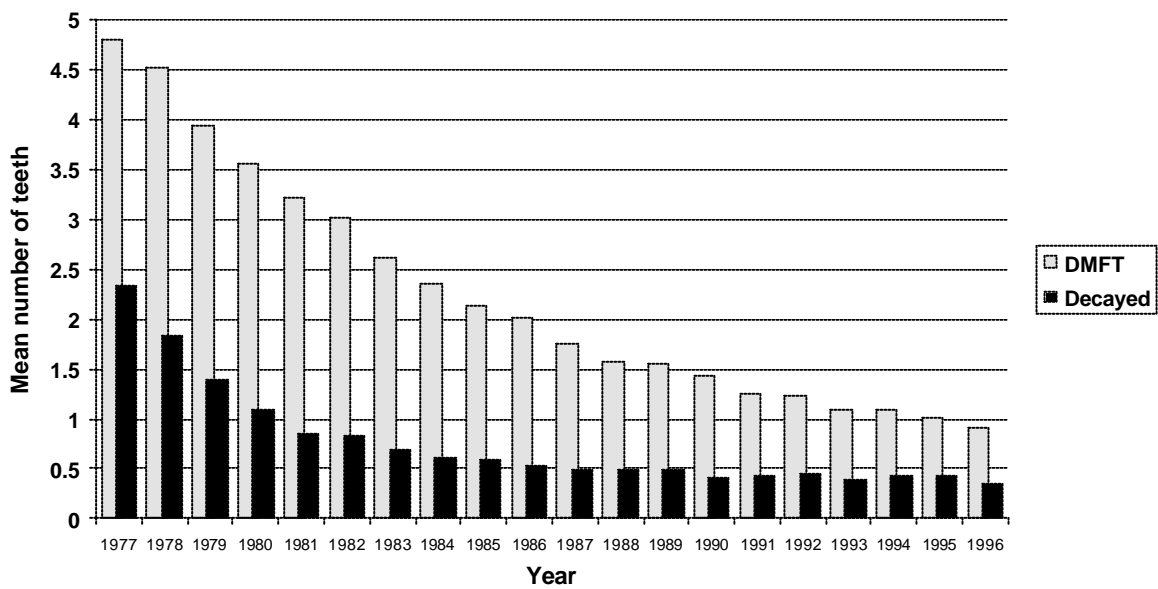


Figure 3. Mean DMFT and decayed component for 12-year-old children in Australia from 1977 to 1996.

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