



Australian Government
 Australian Institute of
 Health and Welfare

AIHW Dental Statistics
 and Research Unit
 Research Report No. 28

Urban and rural variations in child oral health



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This report provides information on the oral health of Australian children during 2001, and investigates differences in the oral health between children living in rural and urban areas. Children from rural areas have often been found to have poorer health outcomes than their urban counterparts. This report compares oral health status and receipt of fissure sealants across residential locations and evaluates whether socioeconomic factors account for geographic variation.

Data collection

Findings presented in this Research Report are based on data collected for the *Child Dental Health Survey, Australia 2001* (Armfield et al. 2006). The Survey collects data from a sample of Australian children and is part of a national time series dating back to 1977.

Data are derived from routine examinations of children attending the School Dental Service of the respective states and territories. The School Dental Service covers children from both government and non-government schools and visits may involve preventive services and restorative treatments. However, there are some variations across state and territory programs in terms of priority groups, services provided and the interval between examinations. Data from Tasmania were unavailable due to a lack of information on child residential postcode, while data from New South Wales were not used in 2001 due to problems in sampling methodology.

The findings presented are based on data that have been weighted using the age and sex distribution of children in Australia (based on Australian Bureau of Statistics data) to produce estimates representative of the population of children. In addition, data were weighted within state/territory by interval between examinations so that children with less caries who are often on longer recall schedules were not under-represented in the analysis. Nonetheless, it

should be noted that only children enrolled in and visiting the School Dental Service are included in the results; therefore the findings may not apply to children not enrolled in the School Dental Service.

Measuring remoteness

Classifications of remoteness are based on the Rural, Remote and Metropolitan Areas (RRMA) index originally developed in 1994 (DPIE & HSH 1994). The RRMA index uses statistical local areas (SLAs) as basic building blocks, and calculates an index of remoteness for each SLA. For the purpose of analysis the original six remoteness categories in the index are collapsed into three categories: 'Metropolitan capital city' and 'Metropolitan other' are classified as Metropolitan; 'Rural large centre', 'Rural small centre' and 'Rural other' are classified as Rural; and 'Remote centre' and 'Remote other area' are classified as Remote. The postcode of the child's residence was used to classify the child. If this was not available, the postcode of the attending clinic was used.

Sample characteristics

The distribution of children from metropolitan, rural and remote areas by state and territory is presented in Table 1. Reasonably high percentages of children from rural areas were obtained from Victoria, Queensland, Western Australia and South Australia, while only the Northern Territory had large percentages of children living in remote areas.

	Vic	Qld	WA	SA	ACT	NT	All
Metro	7,759 (76.8)	9,598 (77.2)	9,478 (69.2)	40,265 (72.2)	647 (91.4)	2,644 (41.4)	70,391 (71.0)
Rural	2,277 (22.5)	2,205 (17.7)	3,062 (22.3)	15,408 (27.6)	61 (8.6)	770 (12.1)	23,793 (24.0)
Remote	68 (0.7)	635 (5.1)	1,162 (8.5)	119 (0.2)	0 (0.0)	2,973 (46.5)	4,957 (5.0)
All	10,104	12,438	13,702	55,792	708	6,387	99,131

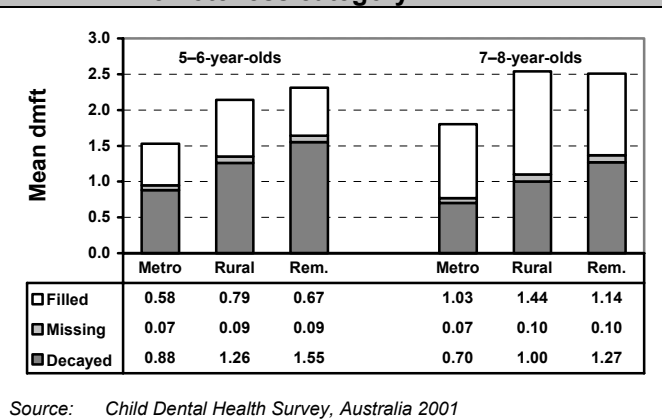
Deciduous caries experience

Caries experience in the deciduous dentition ('baby' teeth) was analysed only for children aged between 4 and 10 years. At age 10 children only have approximately 8 deciduous teeth remaining in their mouth compared with about 20 for the youngest age groups.

Decayed, missing and filled teeth

The mean number of decayed, missing and filled teeth (dmft) was highest for remote dwelling 5-6-year-olds, and higher for children residing in rural than in metropolitan areas (Figure 1). For 7-8-year-old children, the mean dmft was similar for rural and remote dwellers and both were higher than for children from metropolitan areas. The average number of decayed teeth increased with increasing geographic remoteness for both age groups.

Figure 1: Deciduous caries experience by remoteness category



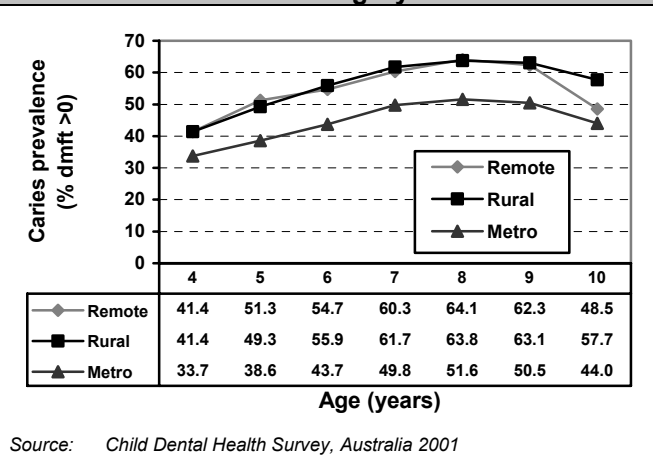
Caries prevalence

Caries prevalence refers to the percentage of children with either current or past dental caries experience (dmft > 0). Across most age groups caries prevalence was similar for rural and remote dwelling children (Figure 2). Approximately 8-12% fewer children from metropolitan areas had evidence of current or previous caries experience in their deciduous dentition, compared to children from rural or remote areas.

Significant Caries Index (SiC)

While mean scores provide a good measure of population disease levels, it is important to also look at those children who might be carrying a significant burden of the dental disease experience in the population.

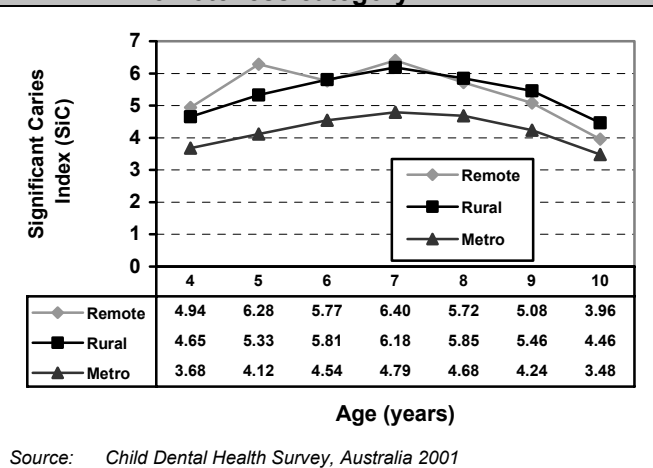
Figure 2: Deciduous caries prevalence by age and remoteness category



For example, research has found that approximately 20-25% of 4-10-year-olds account for 90% of the disease experience of their respective age groups (ARCPHO 2005). To examine these children the Significant Caries Index (SiC; Brattthall 2000) was developed. The SiC looks at the caries experience of the 30% of children with the most disease.

The 30% of rural and remote dwelling children with the most caries experience had higher mean dmft than children dwelling in metropolitan areas (Figure 3). This means that there is more extreme disease experience in rural and remote areas than in metropolitan areas.

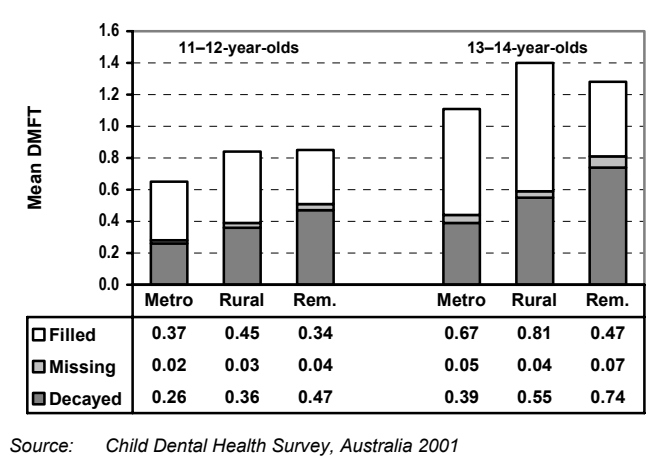
Figure 3: Significant Caries Index (SiC) by age and remoteness category



Permanent caries experience

Caries experience in the permanent (or 'adult') dentition was analysed for children aged between 6 and 15 years. It should be noted, however, that at age 6, children on average have only about 5 permanent teeth present, with the average increasing to almost 28 among 15-year-olds.

Figure 4: Permanent caries experience by remoteness category



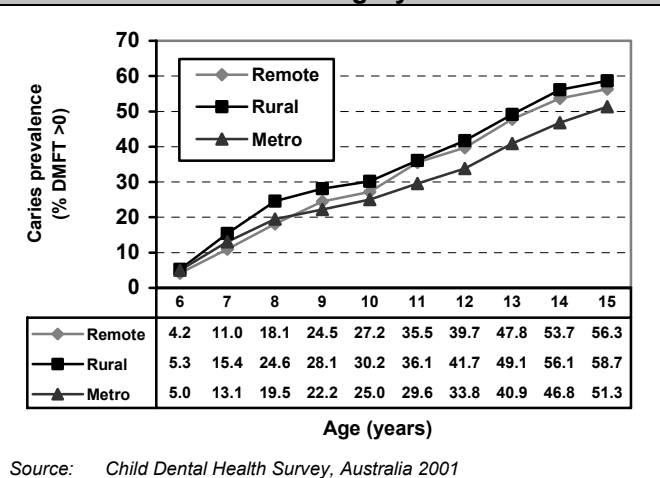
Decayed, missing and filled teeth

In both the 11-12-year-old and 13-14-year-old age groups children from metropolitan areas had fewer decayed, missing or filled permanent teeth (DMFT) than children from rural or remote areas (Figure 4). There was a trend for the decayed component of the DMFT index to increase with greater geographical remoteness. Children in rural and metropolitan areas received more fillings than did children residing in remote areas.

Caries prevalence

From the age of 9 years, there was reduced caries prevalence among children residing in metropolitan areas compared with children dwelling in rural or remote regions (Figure 5). These differences were greatest for 13- and 14-year-olds.

Figure 5: Deciduous caries prevalence by age and remoteness category

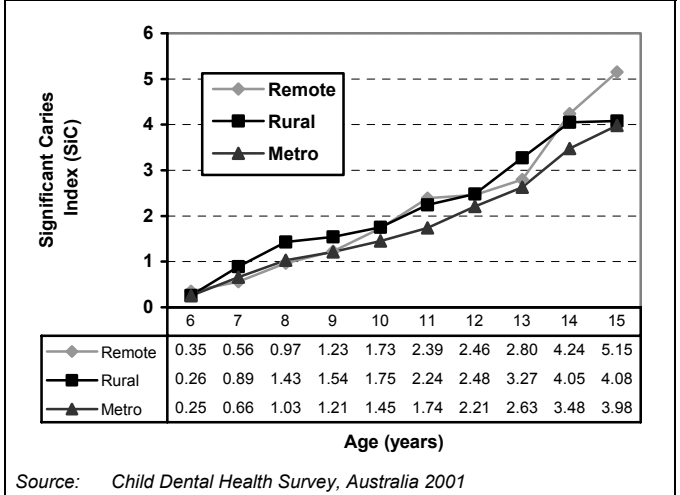


Significant Caries Index (SiC)

The SiC for the permanent dentition of 6-15-year-olds is shown in Figure 6. The highest SiC

between the ages of 7 and 10 years is found for children from rural areas, while children from remote areas have the highest SiC among the oldest children (14- and 15-year-olds). From the age of 9 years onwards, children from metropolitan areas have a lower SiC index than do children from rural or remote locations.

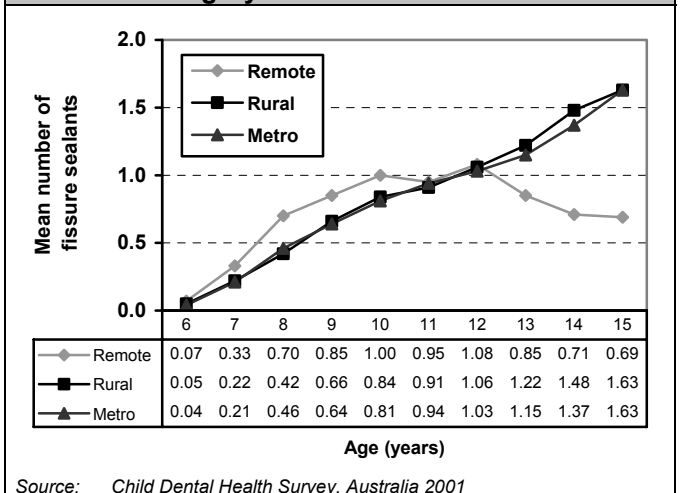
Figure 6: Significant Caries Index (SiC) by age and remoteness category



Fissure sealants

Fissure sealants are used to prevent caries in the more susceptible grooved surfaces of permanent teeth. As shown in Figure 7 remote dwelling children up to about the age of 10 years received more fissure sealants on average than did children from metropolitan and rural areas. However, from the age of 13 years onwards there is a widening gap between the mean number of fissure sealants in remote dwelling children compared to other children. The reason for this is not obvious but may reflect changes in fissure sealant provision over time across regions.

Figure 7: Fissure sealants by age and remoteness category



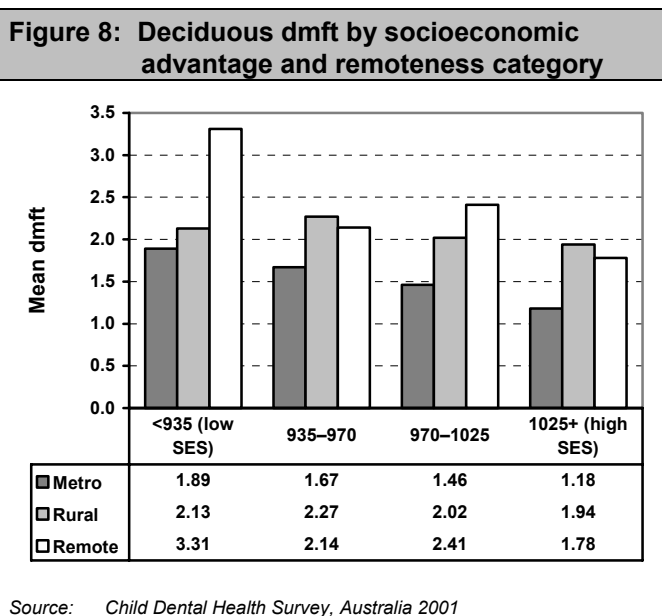
Socioeconomic differences

It is possible that oral health differences between children from different geographic areas is merely a reflection of socioeconomic status (SES) differences between the areas. The Socio-economic Indexes for Areas (SEIFA) Index of Relative Socio-economic Advantage/Disadvantage (IRSD) was therefore used to classify children, based on postcode, into one of four groups of socioeconomic advantage. The IRSD is a composite score of 20 items, believed to all measure SES, derived from the 2001 Australian census. A low score on the index indicates that an area has a higher proportion of individuals with low incomes, more employees in unskilled occupations, etc. The distribution of socioeconomic categories across metropolitan, rural and remote locations is given in Table 2.

Table 2: Socioeconomic advantage by remoteness category

IRSD score	Metro (%)	Rural (%)	Remote (%)
<935 (low SES)	25.7	51.8	23.3
935–970	19.4	32.7	19.2
971–1,025	22.3	12.1	27.3
1,025+ (high SES)	32.6	3.4	30.2

Oral health differences existed across remoteness categories within each category of socioeconomic advantage (Figure 8). Children from metropolitan areas, across all categories of socioeconomic advantage, had a lower mean deciduous dmft than children from rural or remote locations.



References

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Summary

- Children from rural and remote areas have higher prevalence and mean caries experience than children from metropolitan areas.
- The mean number of fissure sealants present varied by remoteness category and age.
- Even after controlling for socioeconomic factors, differences in caries experience between metropolitan, rural and remote children remain.

© AIHW Dental Statistics and Research Unit, May 2006
 AIHW Catalogue No. DEN 154
 ISSN 1445-7441 (Print)
 ISSN 1445-775X (Online)

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The AIHW Dental Statistics and Research Unit (DSRU) is a collaborating unit of the Australian Institute of Health and Welfare, established in 1988 at The University of Adelaide and located in the Australian Research Centre for Population Oral Health (ARCPOH), School of Dentistry, The University of Adelaide. DSRU aims to improve the oral health of Australians through the collection, analysis and reporting of information on oral health and access to dental care, the practice of dentistry and the dental labour force in Australia.

Published by:
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