

**O**ral health among adults in Australia has improved in recent decades, with dramatic reductions in complete tooth loss. However, public dental patients remain a group with reported high levels of emergency care and associated higher levels of tooth extraction compared with the general population (DSRU, 1993). Persons eligible for public dental care generally are holders of government health cards, such as the unemployed and aged pensioners. These card-holders are a financially disadvantaged group of adults within the Australian population. Geographic location has also been linked with inequalities in access to dental care in Australia and may compound the problems faced by public dental patients.

This report describes the oral health of public dental patients in rural and urban areas by age and type of visit based on a total of 2,746 dental patients who were examined by the dental authorities in four States/Territories of Australia, providing a representative sample of the public dental patients they treated during the 2001-02 period.

## Location by age and visit type

Location of patients is presented in Table 1 by age group and visit type. A higher percentage of emergency care patients were aged 18-24 and 25-44 years compared with general care. There was little difference in age distributions between urban and rural patients attending for general care, but among emergency care patients there was a lower percentage aged 65+ years in rural (16.3%) compared with urban (32.2%) areas.

Age group	Emergency		General	
	Urban	Rural	Urban	Rural
18-24 years	7.7	12.2	3.3	2.4
25-44 years	35.8	41.3	24.5	29.0
45-64 years	24.4	30.2	29.2	31.8
65+ years	32.2	16.3	42.9	36.7

## Edentulism

The percentage of edentulous patients (i.e., those with no natural teeth) is presented in Table 2 by location, visit type and age. Overall, a higher percentage of rural patients were edentulous (9.2%) compared with urban patients (5.5%).

**Table 2: Edentulism: by location, visit type and age group (%)**

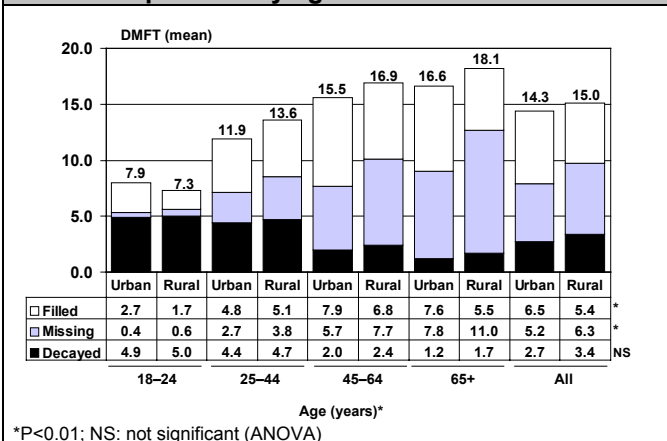
	Age group (years)				Total
	18-24	25-44	45-64	65+	
<b>Emergency<sup>NS</sup></b>					
Urban	0.0	0.0	2.2	10.1	3.7
Rural	0.0	0.0	1.1	10.2	2.1
<b>General*</b>					
Urban	0.0	0.0	5.2	14.7	7.7
Rural	0.0	7.7	14.6	28.3	17.0
<b>Total*</b>					
Urban	0.0	0.0	3.7	12.5	5.5
Rural	0.0	2.8	7.7	22.3	9.2

\*P<0.01; NS: not significant ( $\chi^2$ )

## Caries experience

Caries experience (dental decay) can be measured as the number of untreated decayed teeth (D), missing teeth (M) extracted due to caries, and filled teeth (F) restored due to caries. Figure 1 shows the mean number of decayed, missing and filled teeth (i.e., DMFT = D+M+F) by age of patient. Overall, rural patients had more missing teeth but fewer filled teeth than urban patients.

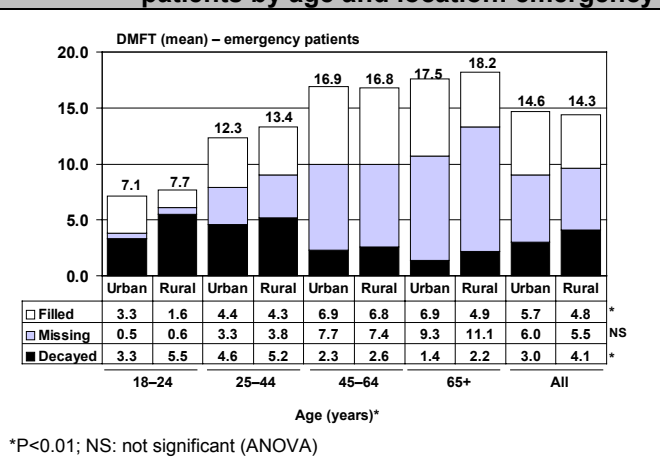
**Figure 1: Caries experience (DMFT) among public patients by age and location**



### Caries experience: emergency patients

Figure 2 presents caries experience among urban and rural patients attending for emergency care. Rural patients seeking emergency care had a higher average number of decayed teeth than urban patients. However, there was little difference in the number of missing teeth between urban and rural emergency care patients. In contrast to decayed teeth, the number of filled teeth was lower for rural compared with urban emergency care patients.

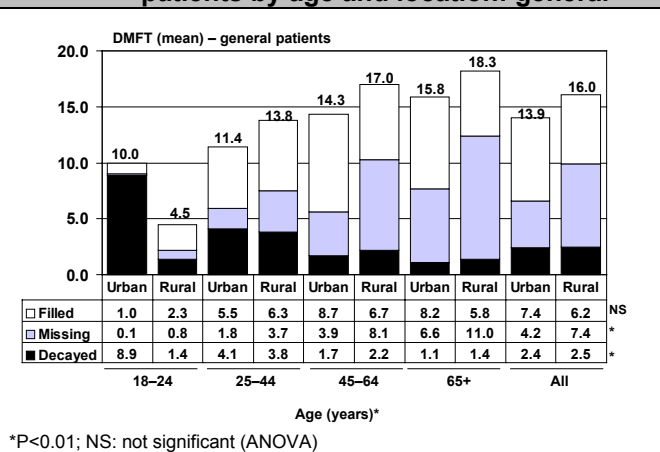
**Figure 2: Caries experience (DMFT) among public patients by age and location: emergency**



### Caries experience: general care patients

Figure 3 presents caries experience among urban and rural patients undergoing a general course of care. As outlined in Table 1, there were few general care patients in the 18-24 years age group. Hence there was little difference overall in the number of decayed teeth by location, despite the difference in the youngest age group. In contrast to emergency care, rural patients attending for general care had more missing teeth compared with urban patients, but there was no difference in the number of filled teeth by location.

**Figure 3: Caries experience (DMFT) among public patients by age and location: general**



### Denture wearing

Table 3 presents the distribution of dentures in the upper jaw by location and age. In both urban and rural locations, the percentage of patients with dentures or bridges increased across older age groups, reflecting the cumulative effect of tooth loss and replacement with age. While there was little difference in denture wearing by location among younger age groups, a higher percentage of rural compared with urban patients had full dentures and a lower percentage partial dentures in the 45-64 and 65+ year age groups.

**Table 3: Denture wearing: by location and age group (%) – upper jaw**

	Age group (years)				Total*
	18-24	25-44	45-64	65+	
<b>Urban</b>					
No prostheses	100.0	89.7	61.6	35.4	<b>63.6</b>
Full denture	0.0	1.4	13.7	34.4	<b>16.4</b>
Partial denture	0.0	7.4	21.5	27.4	<b>17.8</b>
Fixed bridge	0.0	1.4	2.7	2.0	<b>1.8</b>
Partial denture & fixed bridge	0.0	0.0	0.5	0.8	<b>0.4</b>
<b>Rural</b>					
No prostheses	100.0	89.5	57.3	34.2	<b>66.5</b>
Full denture	0.0	4.4	25.6	43.5	<b>20.9</b>
Partial denture	0.0	6.1	15.2	20.9	<b>11.8</b>
Fixed bridge	0.0	0.0	1.3	1.4	<b>0.7</b>
Partial denture & fixed bridge	0.0	0.0	0.6	0.0	<b>0.2</b>

\*P<0.01: urban vs rural ( $\chi^2$ )

Denture wearing in the lower jaw is presented in Table 4 by location and age. While there was little difference by location, higher percentages of urban patients had partial dentures.

**Table 4: Denture wearing: by location and age group (%) – lower jaw**

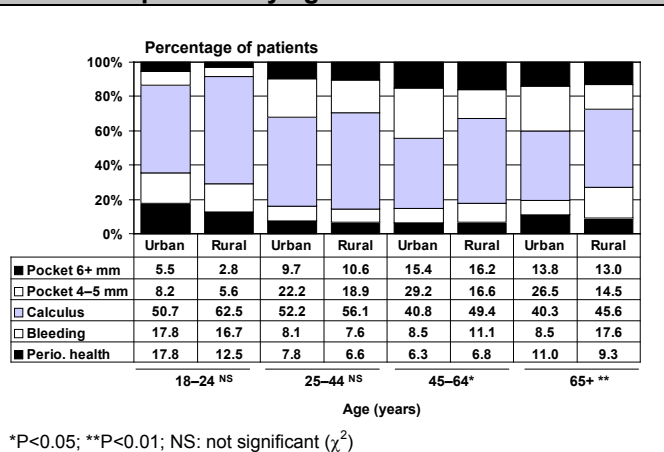
	Age group (years)				Total*
	18-24	25-44	45-64	65+	
<b>Urban</b>					
No prostheses	100.0	94.7	79.0	59.2	<b>78.3</b>
Full denture	0.0	0.0	3.6	11.9	<b>5.3</b>
Partial denture	0.0	4.8	16.9	26.4	<b>15.3</b>
Fixed bridge	0.0	0.5	0.5	2.4	<b>1.1</b>
Partial denture & fixed bridge	0.0	0.0	0.0	0.0	<b>0.1</b>
<b>Rural</b>					
No prostheses	100.0	96.6	83.6	59.2	<b>83.1</b>
Full denture	0.0	0.6	4.3	15.9	<b>5.9</b>
Partial denture	0.0	2.8	10.8	24.5	<b>10.6</b>
Fixed bridge	0.0	0.0	1.3	0.4	<b>0.4</b>
Partial denture & fixed bridge	0.0	0.0	0.0	0.0	<b>0.0</b>

\*P<0.01: urban vs rural ( $\chi^2$ )

## Periodontal status

Periodontal status was recorded using the Community Periodontal Index (CPI), and is presented as the percentage of patients categorised by their maximum sextant scores. Figure 4 shows that there was little difference in periodontal status by location among younger patients but that a higher percentage of urban patients had periodontal pockets 4–5 mm among the 45–64 and 65+ years age groups. Patterns of periodontal disease may be influenced by the number of teeth that are present. The observation that older rural patients had better periodontal status may be due to a survivor effect linked to higher levels of tooth loss, whereby relatively healthy teeth are retained in older age, and teeth with deep pockets are more likely to be extracted.

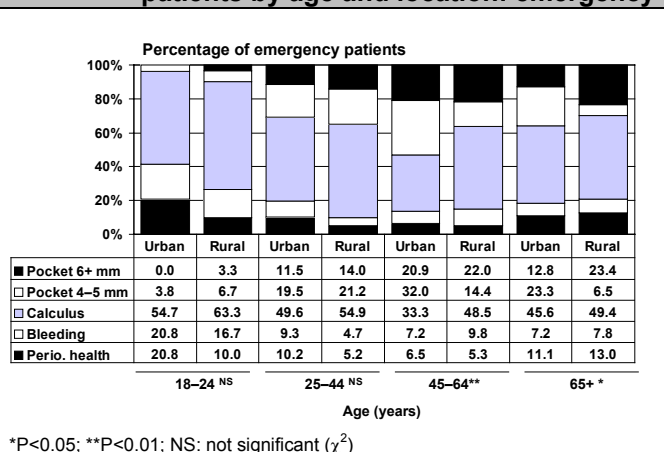
**Figure 4: Periodontal status (CPI) among public patients by age and location**



## Periodontal status: emergency patients

Figure 5 shows that a lower percentage of rural compared with urban emergency care patients had pockets of 4–5 mm for 45–64 and 65+ year-olds, but a higher percentage of rural compared with urban 65+ year-olds had pockets 6+ mm.

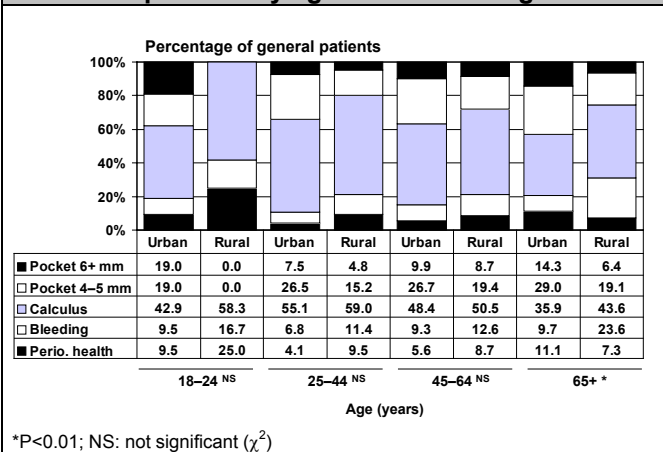
**Figure 5: Periodontal status (CPI) among public patients by age and location: emergency**



## Periodontal status: general patients

Among general care patients there were few 18–24-year-olds (Table 1), but among older patients the most pronounced difference in periodontal status (Figure 6) was lower percentages of rural compared with urban 65+ year-olds with pockets 4–5 mm and 6+ mm.

**Figure 6: Periodontal status (CPI) among public patients by age and location: general**



## Adult Dental Programs Survey

The Adult Dental Programs Survey is a random sample of patients attending for public-funded dental care. Data were collected on oral health status, and patient, visit and service details.

Oral health was assessed by dentists at the initial visit of a course of care. Written instructions were used, but there was no formal calibration in diagnostic criteria. Coding of caries experience was based on the US National Institute of Dental Research (NIDR 1987) protocol. Oral health was evaluated using visual and tactile information alone. Periodontal status was recorded using the Community Periodontal Index (WHO, 1997). A periodontal probe was used to measure pocket depth and detect subgingival calculus or bleeding.

Location was classified as 'urban' or 'rural' for n=1,482 and n=1,168 patients respectively, based on postcode using the RRMA classification scheme (1994). Visit type was classified as 'emergency' if care was initiated for relief of pain; otherwise visit type was classified as 'general'.

Data were weighted by the estimated number of persons whose last dental visit was public-funded in the last year for persons aged 18 years or more from the National Dental Telephone Interview Survey to provide representative estimates for adults receiving public dental care in each participating State/Territory.

## Scope of data

This report is based on data collected on 2,746 patients in 2001–02 by the dental authorities in New South Wales (n=733), Queensland (n=533), Western Australia (n=1,197) and Northern Territory (n=283).

Sample size estimates were based on measures of oral health status from the 1995–96 Adult Dental Programs Survey (Brennan & Spencer 1997). To achieve estimates of key outcome variables with a precision of 20% relative standard error or less, target yields were set of 324 patients in smaller States (Tasmania) and Territories and 648 patients in mainland States. While the obtained sample yields varied between localities, limiting disaggregations in some specific localities, the total sample yield across all localities exceeded the target, thereby providing a sufficient sample size to achieve the desired level of precision.

Estimates based on users of dental services are by definition restricted to those persons who were able to access dental care and therefore may not necessarily be representative of the population eligible for public dental services who did not access dental care during the survey period.

## Summary

### Edentulism

- The percentage of edentulous patients (i.e., having no natural teeth) was higher in rural (9.2%) compared with urban areas (5.5%).

### Caries experience

- Rural patients had more missing teeth (6.3) compared with urban patients (5.2) but fewer filled teeth (5.4) than urban patients (6.5).
- Rural patients seeking emergency care had a higher number of decayed teeth (4.1) than urban patients (3.0), but the number of filled teeth was lower for rural (4.8) compared with urban emergency care patients (5.7).
- Rural patients in general care had higher levels of missing teeth (7.4) compared with urban patients (4.2).

### Denture wearing

- Higher percentages of rural (20.9%) compared with urban (16.4%) patients had full upper dentures and, conversely, lower percentages had partial dentures (11.8% and 17.8% respectively).

## Periodontal status

- A lower percentage of rural patients had periodontal pockets 4–5 mm among 45–64 (16.6%) and 65+-year-olds (14.5%) compared to urban patients (29.2% and 26.5% respectively).

## Acknowledgements

This research was assisted by the Population Health Division of the Commonwealth Department of Health and Ageing. The Adult Dental Programs Survey was collected in collaboration with the dental authorities in the participating States/Territories of Australia.

## References

- Brennan DS, Spencer AJ. *Prospective Adult Dental Programs Survey, 1995–96*. Adelaide: DSRU, 1997.
- Department of Primary Industries and Energy, Department of Human Services and Health. *Rural, remote and metropolitan areas classification*. Canberra: 1994.
- DSRU. *Dental care for adults in Australia. Proceedings of a workshop*. Adelaide: DSRU, 1993.
- NIDR. *Oral health of United States adults*. USA: US Department of Health and Human Services, National Institutes of Health, 1987.
- Stewart JF, Carter KD, Brennan DS. *Adult access to dental care. Rural and remote dwellers*. Adelaide: DSRU, 1998.
- WHO. *Oral health surveys: basic methods*. Fourth edition. Geneva: WHO, 1997.

*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. DSRU is located within the Australian Research Centre for Population Oral Health (ARCPOH), Dental School, 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:

AIHW Dental Statistics and Research Unit  
ARCPOH, Dental School  
The University of Adelaide  
SOUTH AUSTRALIA 5005

Email: [aihw.dsr@adelaide.edu.au](mailto:aihw.dsr@adelaide.edu.au)  
Phone: 61 8/(08) 8303 4051  
Fax: 61 8/(08) 8303 4858

[www.adelaide.edu.au/socprev-dent/dsr](http://www.adelaide.edu.au/socprev-dent/dsr)

© AIHW Dental Statistics and Research Unit, November 2002  
AIHW Catalogue No. DEN 114  
ISSN 1445-7441 (Print)  
ISSN 1445-775X (Online)