

**T**his report provides information on some aspects of oral health and the use of dental services in rural and remote areas of Australia. Historically, higher rates of tooth loss and problem-oriented dental visiting patterns have been characteristic of rural and remote areas. Differences by cardholder status and geographical location are presented. Comparisons between the National Dental Telephone Interview Survey 1999 and combined data from the 1994, 1995 and 1996 surveys have been included.

## Dentate status

Complete loss of all natural teeth (edentulism) is an adverse outcome of the cumulative effects of past disease and treatment. Variations in tooth loss between urban, rural and remote locations may indicate differing availability of and access to dental services, patient preferences and treatment patterns over time.

**Table 1: Complete tooth loss among adults, 1994–96 and 1999**

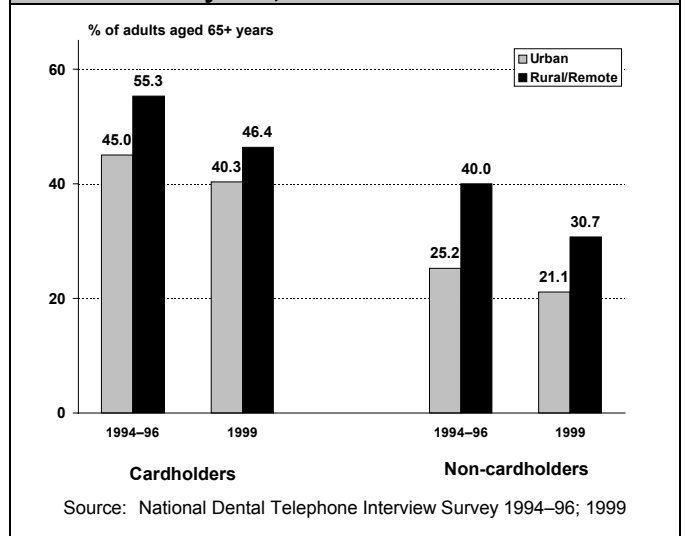
	1994–96		1999	
	Urban	Rural/Remote	Urban	Rural/Remote
18–24 years	0.1	0.1	0.0	0.0
25–44 years	1.4	2.1	0.6	1.1
45–64 years	11.7	21.0	10.5	16.2
65+ years	36.6	49.6	31.5	40.1

Source: National Dental Telephone Interview Survey 1994–96; 1999

Older age groups and residents of rural/remote locations had higher levels of complete tooth loss (Table 1). Less than 2.1% of adults aged below 45 years had lost all their natural teeth; however, in rural/remote areas this increased to over 16% of 45–64 year-olds and over 40% of those aged 65+ years. Comparisons of the 1994–96 and 1999 survey data indicated that complete tooth loss has continued to decline within all age groups and both geographic areas.

Figure 1 presents complete tooth loss among cardholders and non-cardholders aged 65+ years. In the 1999 survey almost 47% of cardholders from rural/remote areas and just over 40% of urban cardholders reported having no natural teeth. Complete tooth loss was less prevalent among non-cardholders; however, large differences existed between urban and rural/remote residents, 21.1% compared to 30.7%.

**Figure 1: Complete tooth loss among adults aged 65+ years, 1994–96 and 1999**

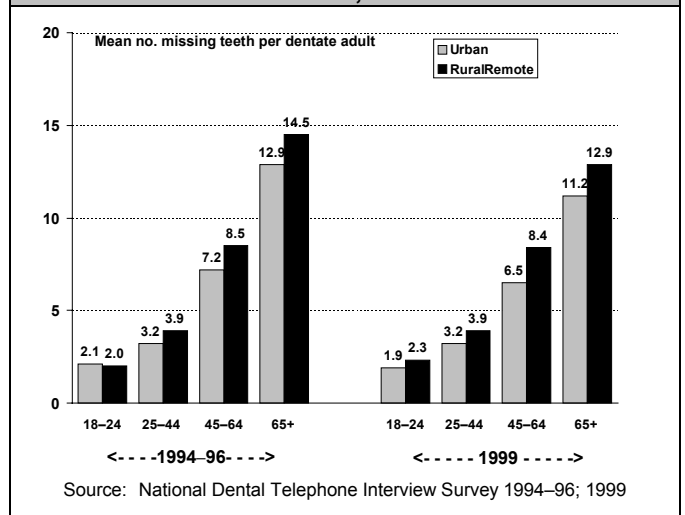


Edentulism declined between the two data collection periods, particularly among respondents from rural/remote locations (cardholders: from 55.3% to 46.4%; non-cardholders: from 40.0% to 30.7%).

## Number of missing teeth

The relationship between age and the mean number of missing teeth among dentate adults (those with some natural teeth) is shown in Figure 2. Past treatment in the form of extractions was most pronounced among adults aged 65+ years living in rural/remote areas, who in 1999 had an average of 12.9 teeth missing compared to urban residents, 11.2 missing teeth.

**Figure 2: Missing teeth by age group – dentate adults, 1994–96 and 1999**

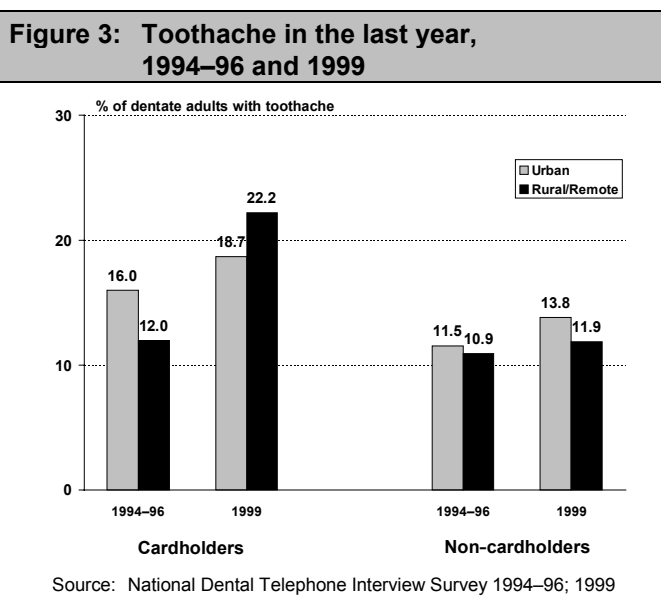


Rural/remote adults had a greater number of missing teeth than urban dwellers in all age groups. By the age of 45+ years, rural/remote residents had almost two more teeth missing than those living in urban areas.

Comparison of the 1999 survey results with the 1994-96 data shows that the mean number of missing teeth had declined among urban dwellers aged 45 years and over. Among rural/remote residents aged 65+ years a smaller improvement occurred, and there was no change among the 45-64 years age group.

## Social impact

A range of social impacts was investigated to determine the extent of inequality between groups.

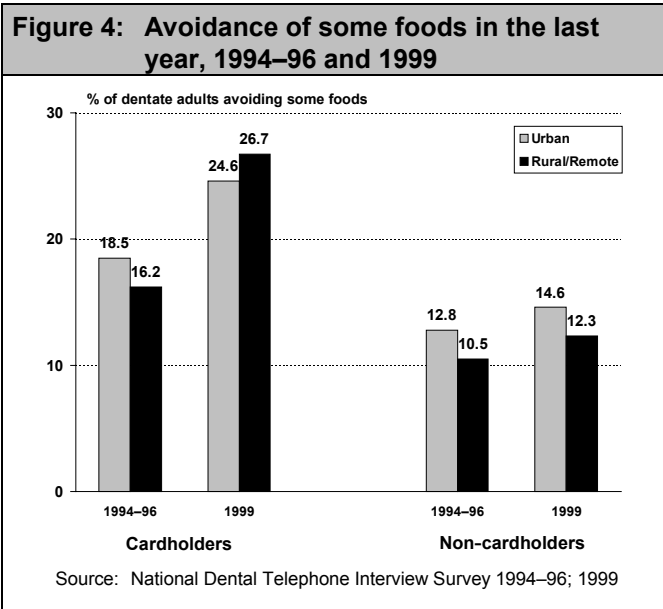


Participants were asked about toothache and the frequency of avoiding some foods. Cardholders reported a higher level of both measures of social impact than non-cardholders. In 1999, cardholder residents of rural/remote locations reported slightly more disadvantage than urban dwellers.

Figure 3 presents the percentage of cardholders and non-cardholders who reported toothache frequency 'very often', 'often' and 'sometimes' in the previous year. Comparisons over time showed that toothache experience in all groups increased, particularly among cardholder groups. The percentage of rural/remote cardholders reporting toothache almost doubled, from 12.0% to 22.2%, and urban cardholders increased from 16.0% to 18.7%.

Data from the earlier surveys reveal that toothache had previously been more prevalent among urban cardholders (16.0%), while rural/remote residents and urban non-cardholders had reported lower levels which ranged from 10.9% to 12.0%.

The inability to chew a wide variety of foods may have consequences for dietary patterns and nutrition, and therefore the general health, of disadvantaged groups. High levels of avoiding some foods 'very often', 'often' and 'sometimes' occurred among cardholders in 1999, almost 27% of rural/remote and 25% of urban cardholders, compared with under 15% of non-cardholders (Figure 4).



Between 1994-96 and 1999, the frequency of reporting food avoidance increased from 16.2% to 26.7% among rural/remote cardholders and from 18.5% to 24.6% among urban cardholders. The percentage among non-cardholders increased slightly, with urban levels marginally higher than rural/remote.

## Access to dental services

The access of an individual to dental services may be influenced by a number of factors. Those presented are the usual reason for a dental visit, the time since the last visit, site of dental visits within the previous 12 months, and the reason for the last visit.

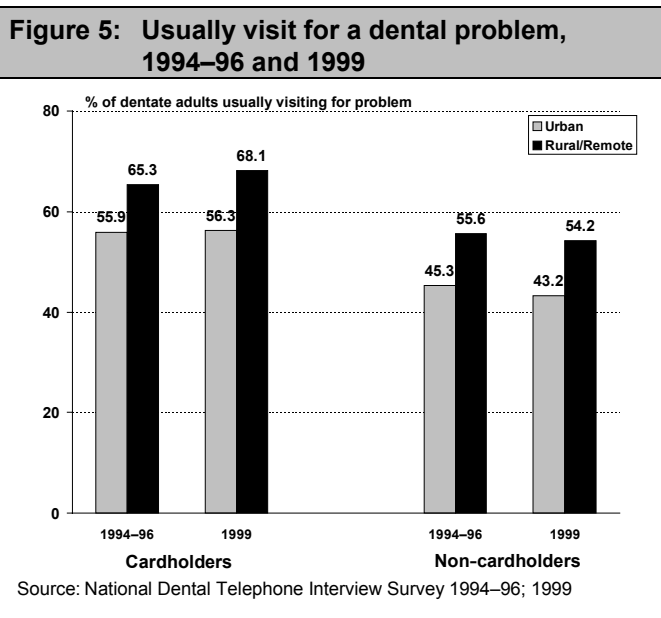
### Usual reason for dental visit

The reason for seeking dental care influences the treatment likely to be received. Visiting for a problem rather than a check-up may reflect an inability to access general dental services in terms of availability and affordability. The lack of oral health facilities and the scarcity of dentists, as well as the greater distances involved, present a barrier to dental care in rural and remote areas.

Dentate adults living in rural and remote areas were more likely to report that they usually made a dental visit in response to a problem than those living in urban areas (Figure 5).

Within each geographic location cardholders reported consistently higher levels of problem-oriented visiting than non-cardholders: 68.1% compared to 54.2% in rural/remote areas in 1999, and 56.3% compared to 43.2% in urban areas.

The lowest level of problem visiting in rural/remote areas, 54.2% among non-cardholders, was almost equivalent to the highest urban level, 56.3% among cardholders.



Comparisons over time revealed that there was little change in the usual reason for dental visits, with a slight increase in rural/remote cardholders visiting for a problem. There was no indication that problem visiting among rural/remote dwellers may be declining.

**Time since last dental visit**

The time since the last dental visit indicates the level of contact with dental services. During the period from 1994 to 1999, very little change occurred in the attendance patterns of dentate adults from urban and rural/remote locations. Consistently lower percentages of rural/remote residents reported that they had made a dental visit in the previous year, approximately 52% compared with 57% (Table 2).

**Table 2: Time since last dental visit – dentate adults, 1994–96 and 1999**

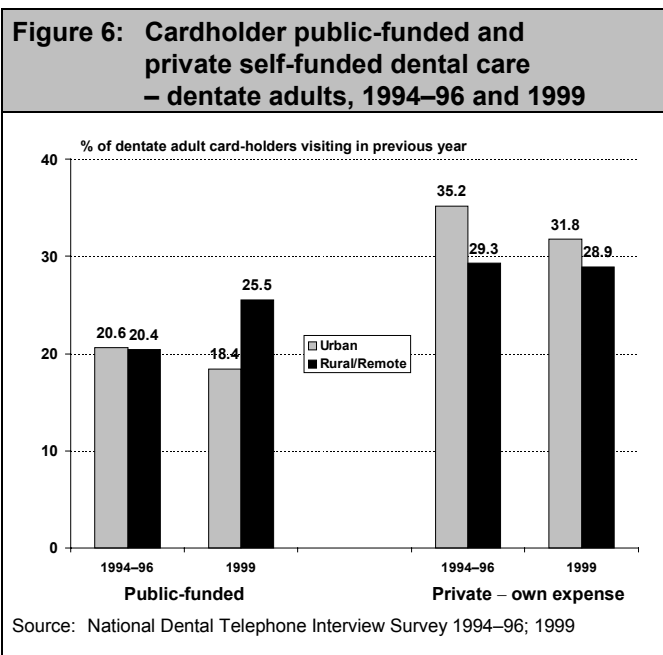
	1994–96		1999	
	Urban	Rural/Remote	Urban	Rural/Remote
<b>Time since last dental visit</b>				
<1 year	57.4	52.2	57.5	52.6
1–<2 years	18.8	18.1	19.6	20.1
2–<5 years	14.1	16.5	13.5	15.5
5+ years	9.4	12.8	9.4	11.8

Source: National Dental Telephone Interview Survey 1994–96; 1999

Almost 13% of rural/remote persons had a period of five or more years elapsed since making a dental visit in 1994–96 (rural/remote dwellers 11.8% compared with urban 9.4% in 1999).

**Site of last dental visit – cardholders**

The percentage of eligible cardholders making a public-funded dental visit in a 12-month period may be a measure of access to/availability of dental services. If the proportions of cardholders who receive public-funded care and private self-funded dental care during a 12-month period change, it may indicate that access to, or availability of, dental services has changed.



In 1999, a higher percentage of rural/remote cardholders made a public-funded dental visit in the previous 12 months, 25.5% compared to 20.4% in 1994–96 (Figure 6). There was little difference over time in levels of cardholders seeking care at private practices at their own expense (approximately 29%). In urban areas the percentage of cardholders receiving public-funded care declined slightly, and there was a similar decrease in the percentage making private own-expense dental visits.

Overall, in the period since the 1994–96 surveys, visiting by rural/remote cardholders increased (slightly) from 49.7% to 54.4%, while urban visiting declined (slightly) from 55.8% to 50.2%. These changes, although non-significant, indicated an improvement in the percentage of rural/remote cardholders receiving public dental care.

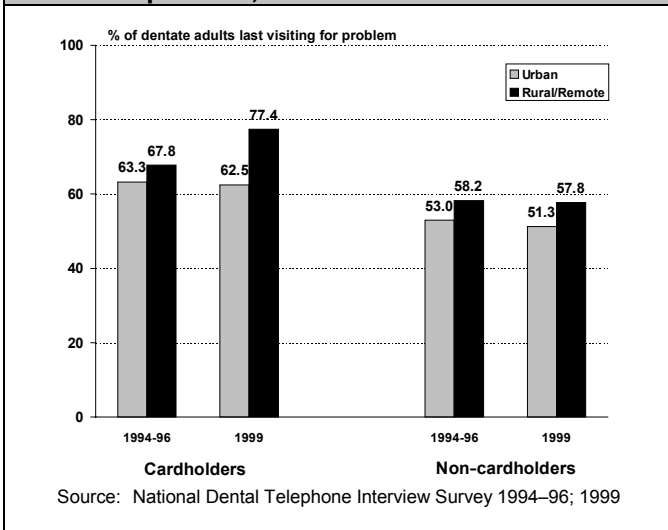
However, the increased availability of public dental care among rural/remote cardholders was caused by changes in one State, and was not Australia-wide. If that one State is omitted, visiting by rural/remote cardholders remained static, 18.1% in 1994–96 and 18.6% in 1999.

### Reason for last dental visit

Adults who had made a dental visit in the previous year were asked whether their most recent visit had been for a dental problem. While all dentate adults, however how long the time since their last visit, reported their usual reason for a dental visit (Figure 5, above), those who had made a dental visit in the previous year reported higher levels of problem-oriented dental visiting (Figure 7).

Dental visits for a problem were more prevalent among cardholders and rural/remote residents. Of those rural/remote cardholders who made a dental visit in the previous year, the percentage who last visited for a problem increased from 67.8% to 77.4% in the period since 1994-96.

**Figure 7: Last visit within 12 months for a dental problem, 1994-96 and 1999**



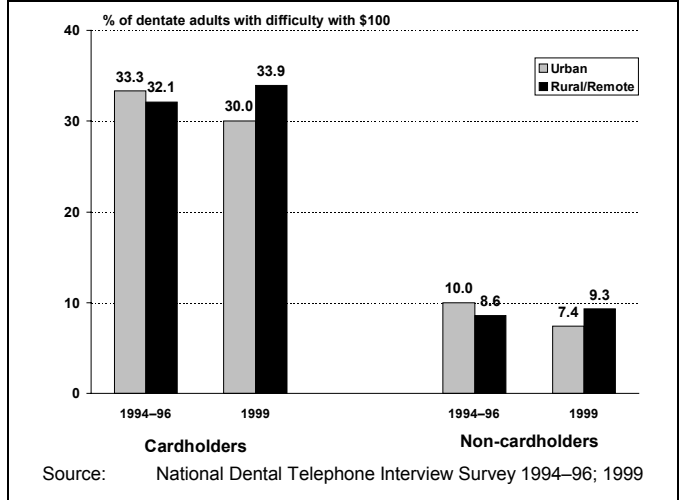
Problem visiting among urban cardholders and non-cardholders showed a marginal decline. In both survey periods, around 63% of urban cardholders reported that their last visit was for a problem, compared with 58% of rural/remote non-cardholders and around 52% of urban non-cardholders.

### Financial constraints

Figure 8 presents the percentage of respondents who reported that they would have great difficulty with a \$100 dental bill. When comparing affordability among cardholder and non-cardholder groups, it can be seen that there was a more than three-fold difference regardless of geographical location. The greatest percentage reporting difficulty was among cardholders from rural/remote locations, 33.9%, compared to 10% or less of non-cardholders.

Within cardholder status relatively similar percentages of urban and rural/remote respondents reported difficulty; however, reporting of difficulty decreased in all urban groups since 1994-96, while rural/remote groups recorded slight increases (32.1% to 33.9% among cardholders).

**Figure 8: Difficulty with a \$100 dental bill, 1994-96 and 1999**

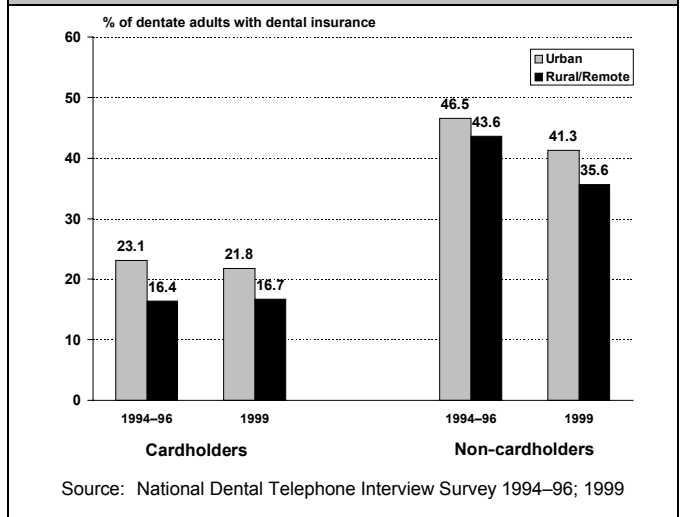


The decrease in difficulty paying a \$100 dental bill in urban areas may reflect inflation and increased income in 1999 compared to 1994-96, but the trend was in the opposite direction for affordability in rural/remote locations.

### Dental insurance

Private dental insurance coverage was substantially higher among urban dwellers than residents of rural/remote areas, and within each geographic location non-cardholders had levels approximately double that of cardholders (Figure 9). Urban non-cardholders had the highest level of dental insurance, 41.3% in 1999, with the lowest reported by rural/remote cardholders, 16.7%.

**Figure 9: Dental insurance, 1994-96 and 1999**



There was a noticeable decline in insurance among non-cardholder groups between the 1994-96 and 1999 surveys, although the level remained stable among cardholders. Reduced levels of insurance were more evident among rural/remote non-cardholders, decreasing from 43.6% to 35.6%, and from 46.5% to 41.3% for urban non-cardholders.

## Services received – extractions

Those respondents who had made a dental visit in the previous year were asked what treatment they had received.

The loss of a tooth indicates the failure of all previous preventive and restorative treatment, and shows a progression of individuals toward complete tooth loss.

**Figure 10: Extractions in the last year, 1994–96 and 1999**

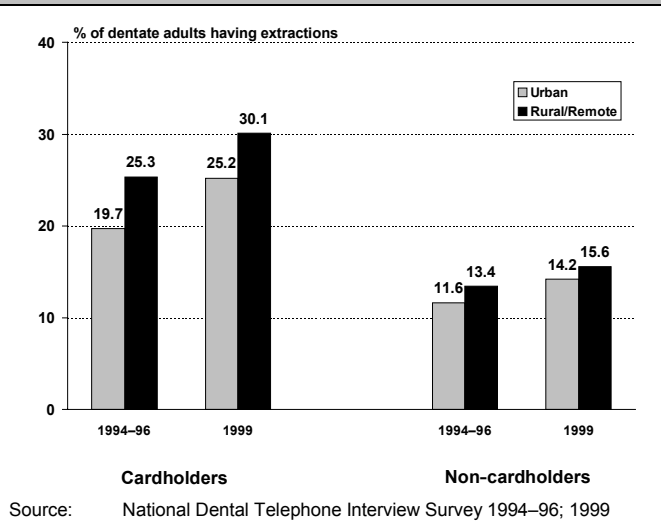


Figure 10 presents the percentage of dentate adults who had one or more teeth extracted at a dental visit in the previous 12 months. A higher percentage of rural/remote residents received extraction services than urban dwellers, and the extraction rate among cardholders was almost double that of non-cardholders. The highest extraction rate, 30.1%, was reported by rural/remote cardholders.

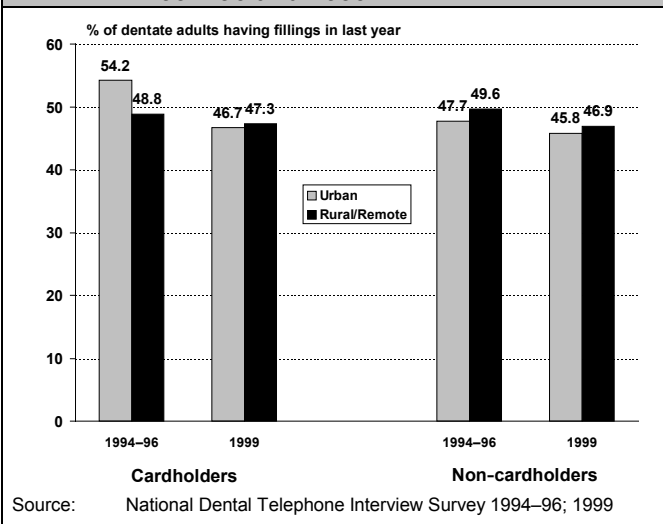
Comparisons over time revealed an increase in the percentage reporting tooth extraction in all groups, with an overall increase from 13.7% in 1994–96 to 16.6% in 1999 (population figures). The increase was most pronounced among cardholders (from 19.7% to 25.2% for urban and from 25.3% to 30.1% for rural/remote cardholders).

## Services received – fillings

Just over 46% of dentate adults who had made a visit in the previous year received one or more fillings, a slight reduction since the 1994–96 surveys (Figure 11).

The percentage of urban-dwelling cardholders receiving fillings decreased from 54.2% to 46.7%. The decline was marginal among urban non-cardholders and rural/remote cardholders, and slightly greater among non-cardholders from rural and remote regions, reducing from 49.6% to 46.9%.

**Figure 11: Fillings in the last year, 1994–96 and 1999**



## Fillings and extractions per person

Table 3 presents the mean number of fillings and extractions per dentate adult who made a visit in the previous 12 months.

**Table 3: Fillings and extractions per person in the last year – 1994–96 and 1999**

	Fillings		Extractions	
	1994–96	1999	1994–96	1999
<b>Urban</b>				
Cardholders	1.09	0.93	0.37	0.57
Non-cardholder	0.95	0.88	0.19	0.26
<b>Rural/remote</b>				
Cardholders	0.95	0.79	0.39	0.60
Non-cardholders	0.98	0.90	0.23	0.26
<b>Total</b>	<b>0.97</b>	<b>0.88</b>	<b>0.24</b>	<b>0.31</b>

Source: National Dental Telephone Interview Survey 1994–96; 1999

In 1999, the mean number of fillings received in the previous year was 0.88 per dentate adult, a reduction from the mean of 0.97 at the time of the 1994–96 surveys. Cardholders showed the most pronounced decrease, from 1.09 to 0.93 (urban) and from 0.95 to 0.79 (rural/remote) per person.

Cardholders received more than twice as many extractions per person as non-cardholders, with the highest rate being 0.60 teeth per person among cardholders from rural/remote areas.

Comparisons over time revealed an increase in extraction rate from 0.24 to 0.31 overall. The difference was most obvious among cardholders, with an increase of more than half as much again as the previous rate of tooth extraction occurring in both locations.

## Summary

During the period 1994–96 to 1999, residents of rural and remote areas of Australia reported:

- reduction in edentulism, although rates of complete tooth loss remained higher than among urban dwellers;
- reduction in the number of missing teeth among those aged 65+ years; however no improvement occurred among the 45–64 years age group;
- little change in the percentage of dentate adults making a dental visit in the previous 12 months, remaining lower than urban visiting levels;
- slightly improved availability of public dental care to rural/remote cardholders;
- no decline in the levels of problem-oriented dental visiting patterns, remaining higher than that of urban dwellers;
- an increase in the percentage of rural cardholders making their last dental visit for a problem;
- increased prevalence of toothache and avoidance of some foods;
- lower levels of dental insurance;
- more extractions in the previous 12 months; and
- fewer fillings in the previous 12 months.

As there was an increase in extractions during this period, it seems unlikely that the reduction in fillings reflects a decrease in disease experience, but that extraction had been chosen as the alternative to more costly options to restore teeth.

The trend towards greater retention of teeth among the 45–64 years age group appears to have been eroded by the increased rate of tooth extraction.

Cardholders from rural and remote areas suffered greater disadvantage compared to those from urban locations, with less favourable patterns of tooth loss and dental visiting. Geographic inequalities in access to dental care continue to exist in Australia.

## Sources of data

**National Dental Telephone Interview Surveys** were conducted in 1994, 1995, 1996 and 1999. In each of the four surveys, interviews were carried out with adults selected from a stratified random sample of all States and Territories.

Information was collected from persons aged 18 years and over (6,589 adults in 1999, response rate 56.6%; and 17,691 adults in combined surveys from 1994, 1995, 1996, response rate 71.5%), and included questions on self-reported oral health and dental visiting characteristics.

Data were weighted to ensure that the samples accurately represent the age and sex distribution of the Australian population at the time of each survey.

Data were classified into urban, rural or remote locations based on the Rural, Remote and Metropolitan Area Classification 1994 (Department of Primary Industries and Energy and Department of Human Services and Health).

The 1999 data included 5,727 dentate adults (3,670 urban; 1,615 rural; 351 remote); cardholders visiting <12 months (418 urban; 243 rural/remote).

The 1994–96 data included 15,142 dentate adults (10,313 urban; 3,792 rural; 975 remote); cardholders visiting <12 months (1,075 urban; 561 rural/remote).

Public-funded dental care includes care provided at public clinics as well as care provided by private practitioners to some eligible cardholders during the Commonwealth Dental Health Program 1994–96.

## Acknowledgements

This research was supported by the Population Health Division of the Commonwealth Department of Health and Ageing.

*The AIHW Dental Statistics and Research Unit (DSRU) is a collaborative unit of the Australian Institute of Health and Welfare established in 1988 at Adelaide University. The DSRU aims to improve oral health of Australians through the collection, analysis and reporting of the oral health and access to dental care of Australians, the practice of dentistry in Australia and the dental workforce.*

**Published by:**

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